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CALIFORNIA
VEGETATION MANAGEMENT

Final Environmental Impact Statement

August 1988

United States
Department of the Interior

Bureau of Land Management
California State Office

COMPLETED

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IN REPLY REFER TO:

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
CALIFORNIA STATE OFFICE
2800 Cottage Way
Sacramento, California 95825

WPC3004R

Dear Reader:

This is the Final Environmental Impact Statement (EIS) for proposed vegetation management on BLM-managed lands in California and northwest Nevada. The statement discloses the probable environmental impacts of the Proposed Action and Alternatives. This EIS will be used during the decisionmaking process which will follow the comment period on this EIS.

The EIS contains updates resulting from the public review of the Draft EIS released in December 1987. Over 300 letters of comment were received of which 52 have been printed in the Final EIS along with BLM's responses.

The Final EIS does not contain the Appendices referred to in the main body of the document. Due to the few changes from the Draft and size of the Appendices only the modifications to the Appendices are listed in the Final. If you do not already have a copy of the Draft EIS which contains the Appendices, additional Draft EIS copies are available at the address below.

Comments received on this Final EIS as well as those received on the Draft will be considered in the decision process. A decision regarding vegetation management will be prepared and issued after September 30, 1988. Comments should be addressed to:

California State Director
c/o Mark Blakeslee
Bureau of Land Management
2800 Cottage Way
Sacramento, California 95825

Additional copies of the Final EIS and of the Draft EIS with Appendices are available at the same address.

Sincerely,

Ed Hastey
Ed Hastey
State Director

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BLM CA ES 88 004 7100

FINAL ENVIRONMENTAL IMPACT STATEMENT

CALIFORNIA VEGETATION MANAGEMENT

Prepared by

U.S. DEPARTMENT OF INTERIOR

BUREAU OF LAND MANAGEMENT

CALIFORNIA STATE OFFICE

Ed Hastey

State Director, California

SUMMARY

This environmental impact statement (EIS) describes and analyzes the environmental impacts of implementing a program to control vegetation on public lands in California and northwest Nevada. In accordance with the National Environmental Policy Act, this EIS identifies impacts on the natural and human environment of three alternatives. Alternative 1, the Proposed Action, is the preferred alternative.

ALTERNATIVES

The proposed program for vegetation control would involve coordination with State agencies, counties, public land lessees and adjoining landowners for both accomplishing vegetation control and ensuring adequate safety factors are applied. Chemical, manual, mechanical and prescribed fire are considered for use. For analysis purposes maximum likely rate of herbicide application is used, however the actual rate of application is expected to be lower and depends on species of vegetation, time of year, application method and formulation of herbicide. Treatment levels for the Proposed Action conform to land use plan objectives and budget capabilities on public lands. Treatment levels for Alternatives 2 and 3 are less due to feasibility and cost considerations.

ALTERNATIVE 1: PROPOSED ACTION

All methods would be available for use with a total of 35,800 acres treated annually. Herbicides would be applied aerially on 5,200 acres and ground vehicles and hand application would treat 800 and 900 acres respectively. Manual methods would treat 500 acres, mechanical treatments would treat 2,400 acres while prescribed fire would be used on 26,000 acres. All safety requirements and project design features would be followed in accordance with BLM policy and EPA registration restrictions, as they would under all alternatives.

ALTERNATIVE 2: NO AERIAL HERBICIDE APPLICATION

This alternative would eliminate the use of aerially applied herbicides and treatments by the other methods would total 31,250 acres. Ground vehicle and hand applied herbicides would be used on 800 and 1,150 acres respectively. Manual and prescribed fire methods would be unchanged from Alternative 1 at 500 and 26,000 acres while mechanical methods would increase to 2,800 acres.

ALTERNATIVE 3: NO CHANGE/NO USE OF HERBICIDES

No herbicides would be used under this alternative. A total of 30,550 acres would be treated by manual (1,200 acres), mechanical (3,350 acres), and prescribed burn methods (26,000 acres).

ENVIRONMENTAL CONSEQUENCES

AIR QUALITY

The major impact to air quality would be short-term, moderate increases in smoke intrusions from prescribed burns and dust generated by mechanical and manual methods under all alternatives. Insignificant chemical drift is expected under Alternatives 1 and 2.

SOILS

Impacts to soils would result in short-term increases in erosion with improved stability over the long term. Some persistence of herbicides would be expected in arid soils but this would not be important because the low level of herbicide expected would not affect productivity.

WATER RESOURCES

The potential for herbicides to be detected in water is greatest under Alternative 1, less under Alternative 2, and nonexistent under Alternative 3. On the other hand the potential for suspended sediment level increases in water would be greatest under Alternative 3. Through use of buffer strips and other project designs neither of these impacts would be expected to be significant.

VEGETATION

While desirable vegetation production would be greatest under Alternative 1 and least under Alternative 3, potential for injury or loss of nontarget species would also be greatest under Alternative 1 and least under Alternative 3. Noxious and poisonous weeds would be controlled under both Alternatives 1 and 2 with less than desired control under Alternative 3.

TIMBER AND SALES AND WOODLANDS

Under Alternative 1 the present annual allowable cut would be maintained, while it would decline under Alternative 2 and decline even further under Alternative 3. No impacts would be expected to woodlands other than a lessened fire hazard to hardwoods due to control of chaparral under all alternatives.

WILDLIFE

Impacts to wildlife would be either beneficial or negative depending on the type of treatment and specific location. The greater amount of beneficial impacts would occur under Alternative 1 but impacts EIS area-wide would be insignificant, and no significant toxic effects to animals are expected, except under accident scenarios.

LIVESTOCK AND WILD HORSES

Production of desirable forage would be greatest under Alternative 1 and least under Alternative 3. No impacts to livestock, horses, or burros from chemicals would be expected.

CULTURAL RESOURCES

Cultural resources would be addressed by the site-specific project proposals as they are developed. The lowest potential of damage to sites would occur under Alternative 1 with an increasing potential under Alternatives 2 and 3.

VISUAL RESOURCES AND RECREATION

There would be a slight potential for negative impacts to visual resources under all alternatives. Alternatives 1 and 2 would control undesirable vegetation in recreation sites while Alternative 3 would allow less control of undesirable plant species than desired for management objectives.

WILDERNESS AND SPECIAL AREAS

There would be no impacts expected other than the slight potential for vegetation damage from accidental spraying or aerial drift of herbicides.

ECONOMIC CONDITIONS

Economics of the EIS area as a whole would be unaffected by any of the alternatives. The productivity of the public lands however would be greatest under Alternative 1 and least under Alternative 3. Local economies and individuals would be slightly affected either negatively or positively depending on their dependence on public land resources for income.

SOCIAL ENVIRONMENT

Individuals relying on public land resources for income would be most satisfied under Alternative 1 and least satisfied with Alternative 3. Those concerned with herbicide hazard would be negatively affected by Alternative 1, less negatively affected by Alternative 2 and not impacted by Alternative 3.

HUMAN HEALTH

Use of herbicides would be in compliance with EPA labels and State regulations. No adverse impacts to either the public or workers from chemicals is expected under any alternative. Workers are under greater risk than the public under all alternatives, however the overall health risk is small relative to other lifetime hazards. The potential for accident from non-herbicide treatment methods would be successively higher under Alternatives 2 and 3 due to increased mechanical and manual treatment efforts.

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Chapter 1

Proposed Actions and Alternatives

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CHAPTER 1

DESCRIPTION OF ALTERNATIVES INCLUDING THE PROPOSED ACTION

PURPOSE OF AND NEED FOR ACTION

The Bureau of Land Management (BLM) proposes to implement a program to control vegetation on public lands in California and northwest Nevada over a 10-year period. This vegetation management would be done to control noxious and poisonous plants, maintain rights-of-way, improve forest management, range management, wildlife habitat, recreation sites and to reduce fuel load.

BLM's main authority and direction for managing public lands derives from the Federal Land Policy and Management Act of 1976, 43 USC 1700 et seq. (FLPMA). Under FLPMA, BLM must manage public lands according to the principles of multiple use and sustained yield. These principles are further qualified in FLPMA by the statutory duty that BLM prevent unnecessary degradation of the public lands. In addition, two federal laws direct weed control on federal lands: the Carson-Foley Act (PL 90-583) and the Federal Noxious Weed Act (PL 93-629).

Under FLPMA and NEPA, BLM has already prepared land use plans for the public lands and assessed the impacts of these land use allocations with EISs. These planning documents are listed at the front of the References Section. The decisions of the plans guide land uses for the public lands. This EIS for vegetation management is tiered to the land use plans. This EIS will address impacts of different vegetation control techniques, while subsequent Environmental Analyses will be tiered to this EIS and more specifically address site-specific impacts of individual projects. The alternatives addressed within this EIS are designed to use different vegetation control techniques to meet management objectives already decided upon by the different planning areas. Nothing in this EIS will supersede or negate any land use restriction imposed by a land use plan. Only vegetation control techniques and methodology decisions will result from this EIS. Changes in grazing management, forestry yield, etc., are not included as they are land use plan decisions previously made.

Vegetation control is necessary to maintain rights-of-way and to protect structures from fire hazards. In forest management vegetation is controlled to promote better survival for reforestation projects and faster growth of timber stands. Brush control is done to improve wildlife habitat, increase forage for livestock and to reduce fuel hazard loading for wildfires. In the desert area there is a need to reduce tamarisk invasion around desert streams and waterholes. Vegetation control is also often needed at recreation sites to maintain trails, remove poison oak and fire hazards. In urban or residential areas where public lands are intermingled with developed lots, local fire agencies require weed abatement activities be undertaken to reduce fire hazard.

Noxious weeds have become established and are spreading on public lands. Rangeland is being invaded, and wildlife habitat is being reduced causing economic loss to these resources. Noxious weeds can only be adequately controlled with joint efforts by federal, state, county and private interests.

Twenty-one noxious weeds have become established on public lands in California and northwest Nevada. The noxious weeds in California as a whole and those found on public lands in the State are listed in Appendix B. Nevada has no similar list. Accordingly, BLM proposes to implement a program for controlling or eradicating these weeds within the EIS area.

In accordance with the National Environmental Policy Act (NEPA) of 1969 (PL 91-140), this environmental impact statement (EIS) identifies impacts on the natural and human environment of the Proposed Action and other alternatives. Since BLM has already completed land use plans through the NEPA process and decided on management objectives, this EIS will not propose changes to those existing land use plans. Therefore, this EIS will only address different alternatives to accomplish the existing management objectives. Comments received in response to a March 20, 1986, Federal Register notice, local news releases and a scoping letter mailed to over 1,700 addresses generally agreed about the need for a vegetation management program EIS. When the team assembled to conduct the analysis and prepare this EIS, an internal scoping session was held to identify the team's perceptions of issues and concerns. The results of this session incorporated concerns and issues raised in the letters received. Concerns were associated with herbicide use, alternative treatment methods, insufficient control of noxious weeds, and potential effects on human health and the environment. (See Appendix A for results of scoping.) The greatest amount of concern is centered on the potential hazard of herbicides on the environment and human health.

Recently several other EISs have been completed which also address many of the issues being covered herein. These EISs have been utilized for reference in this EIS. Included are: Chaparral Management Program EIR, California Department of Forestry 1981; Vegetation Management for Reforestation Draft EIS, USFS Region 5 1983 and 1986; Northwest Area Noxious Weed Control Program EIS, BLM 1985a; Supplement to the Northwest Area Noxious Weed Control Program FEIS, BLM 1987a; Western Oregon Program-Management of Competing Vegetation Draft EIS, BLM 1983 and 1986; and Final EIS on the Eradication of Cannabis on Federal Lands in the Continental United States, DEA 1985.

ALTERNATIVES INCLUDING THE PROPOSED ACTION

Three alternatives, including the Proposed Action (Alternative 1, the preferred alternative), have been identified for impact analysis in Chapter 3. Differences between alternatives include types of treatments, treatment levels, and benefits to other resources. These relationships are shown in Table 1-1. Descriptions of the alternatives and estimates of treatment acres were developed under the assumption that each alternative could be implemented. Treatments and standard mitigation that apply to each alternative are discussed in Management Treatments and Design Features section of Chapter 1.

The California Department of Food and Agriculture has developed a list of designated noxious weed species in California (see Appendix B). The Federal Government also publishes a list of noxious weeds in 7 CFR 360 (included as part of California list). These lists are periodically updated. The programs discussed in this EIS apply primarily to weeds identified as Category A and B species on the State list, but could include any of the weeds on either list. BLM is responsible for implementing a weed control program on the land it administers.

Table 1-1

Estimated Annual Acreage of Vegetation Treatments by Alternative

	Estimated Annual Acreage		
Treatment	(P.A.) Alt. 1	(No Air) Alt. 2	(No Herbicides) Alt. 3
Chemical			
helicopter aerial	5,200	0	0
ground vehicular	800	800	0
ground hand	900	1,150	0
Manual	500	500	1,200
Mechanical	2,400	2,800	3,350
Burning	26,000	26,000	26,000
Totals	35,800	31,250	30,550

Treatments for other land uses such as forestry projects, range improvements, wildlife habitat, tamarisk removal and chaparral management or fuel load reduction would all be done under the limitations and objectives of BLM land use plans. Control of vegetation on rights-of-way, leases, and at recreation sites is primarily guided by considerations for fire safety standards, visibility needs and public safety considerations.

ALTERNATIVE 1: THE PROPOSED ACTION (PA)

Under this integrated approach, managers would use herbicide, manual, mechanical and prescribed fire methods to treat an estimated 35,800 acres annually in the EIS area (Table 1-1).

An estimated 6,900 acres would be treated with herbicides using helicopter, fixed-wing, ground vehicle and hand methods of application. Manual treatment would total approximately 500 acres, and include hand pulling and grubbing with hand tools and use of power tools such as chainsaws. Approximately 2,400 acres would be treated mechanically, utilizing mowing, dozing, tilling, chaining, and crushing. Prescribed burns would include about 26,000 acres.

ALTERNATIVE 2: NO AERIAL HERBICIDE APPLICATION

This alternative would allow the same vegetation management techniques as would the Proposed Action except that herbicides would be applied only by ground application methods. Increased use of ground application of herbicides and mechanical treatments would occur under this alternative. The average annual program would treat approximately 31,250 acres, with 1,950 acres treated with vehicular and backpack applied herbicides, 500 acres manually, 2,800 acres mechanically, and 26,000 acres with prescribed burns. While the amount of ground herbicide use and mechanical treatments would be increased over Alternative 1, the increase would not make up for most of the aerially treated acres dropped between Alternative 1 and this alternative. These other methods do not totally make up for the dropped aerial spraying due to feasibility reasons (e.g., slope) and costs.

ALTERNATIVE 3: NO CHANGE/NO USE OF HERBICIDES

Under this alternative, the present situation would continue and herbicides would not be used under any circumstances. The use of manual and mechanical measures would be increased in an attempt to meet vegetation control objectives, but would fall short of the objectives. Total acres treated would be 30,550 with approximately 1,200 acres treated manually, 3,350 acres mechanically, and 26,000 acres with prescribed burns.

ALTERNATIVES CONSIDERED BUT DROPPED FROM DETAILED ANALYSIS

Two other alternatives were considered initially but were dropped from analysis. Biological control of vegetation was suggested by several scoping letters. However, upon examination no proven biological methods exist to address the types of vegetation control needed by BLM. Insects, pathogens, nematodes and viral agents affect very specific plant species. Use of goats or other animals to forage on target species is impractical because it is not possible to limit grazing to target species, the types of vegetation needed to be controlled cannot be utilized by animals (e.g., manzanita) and the cost of handling and controlling the animals is prohibitive.

A No Prescribed Burning Alternative was also considered but dropped for several reasons. The primary benefit of prescribed burning is fuel load reduction and there seems to be no other viable method to remove fire fuel loads without burning it. Most burn areas are steep and inaccessible so mechanical means are inappropriate, animals cannot utilize the woody vegetation, and herbicide use would simply provide greater amounts of dead vegetation which would burn even hotter in a wildfire situation. Manual removal of chaparral is impractical due to very poor accessibility and the high costs which would be incurred. In addition Memoranda of Understanding with the State and other agencies and landowners would be violated if BLM was to eliminate prescribed burns on public lands.

VEGETATION MANAGEMENT TREATMENTS AND DESIGN FEATURES

The purpose of this section is to discuss preventive measures, treatment methods, and protective measures (design features) that would be used in a vegetation management program. Table 1-1 shows the treatments that would be applied under each alternative. Some acres may receive one or more treatments in combination, including such treatment combinations as herbicide application and burning, mechanical treatment and burning, and manual treatment and herbicide application. Treatment would only occasionally have to be repeated annually in some situations such as for some noxious weeds. On treatment areas such as reforestation, use might be repeated only every few years for a total of about three applications to any site. However most chemical treatments would be the only chemical use on the site for periods of time exceeding 10 years. These interrelated treatments are explained more fully in Appendix C which describes what the different objectives for treatments are and how they are done.

Pretreatment surveys would be conducted in accordance with BLM Manual 9222 before a decision is made to use herbicides on a specific tract (Appendix D). Such surveys would involve consideration of all feasible treatments, including potential impacts, effectiveness, and cost (see Appendix E). Information from such surveys would be used as a basis for prescribing treatments, developing mitigations and water quality BMPs.

Special provisions for treatments would be selected according to the scope of the action, accepted mitigation measures, and the physical characteristics of the specific site. BLM manuals, manual supplements, and field guides provide a variety of approved standard and special provisions. These provisions are updated periodically .as pre- and post- treatment analysis finds a need for change.

Prior to any vegetation treatment or ground disturbance, BLM policy requires a survey of the project site for plants and animals which are federally listed as threatened or endangered, species proposed for such listing, and sensitive species (see Glossary). If a proposed project may affect any listed or proposed Federal threatened or endangered species or its Critical Habitat, BLM will make every effort to modify, relocate, or abandon the project to eliminate all effects. If BLM determines that such a project cannot be altered or abandoned, formal Endangered Species Act section 7 consultation (or conference for proposed species) will be initiated with the U.S. Fish and Wildlife Service (50 CFR 402; Endangered Species Act of 1973, as amended). State listed species are similarly protected and BLM will notify the State as outlined in BLM California Manual Supplement 6840.2.

In addition to protection afforded federally listed species by the Endangered Species Act of 1973, as amended, BLM policy as elaborated in Instruction Memorandum No. CA-85-35, conveys a similar level of protection to sensitive plant species.

Vegetation control activities in wilderness study areas (WSAs) would only be undertaken when no other effective alternative exists. BLM is required to manage WSAs so as not to impair their suitability for preservation as wilderness. Therefore, some actions can occur in WSAs that would not be allowed in wilderness areas. These actions, however, could not impair wilderness values at the time the Secretary of the Interior submits his wilderness suitability recommendations to the President (BLM Interim Management Policy and Guidelines for Lands Under Wilderness Review, USDI, BLM 1979). For the most part vegetation treatments can be undertaken only to maintain previous treatments which were apparent at the time the Wilderness Review process started. Prescribed burns can be done only to maintain fire dependent vegetation and control of small areas of noxious weed or poisonous plant infestations may be undertaken when there is no effective alternative.

In wilderness areas BLM's policy is to allow natural ecological processes to occur and to be interfered with only in rare circumstances. Noxious weeds would not ordinarily be controlled in wilderness areas unless these weeds threaten outside lands or are spreading within the wilderness. In those cases, noxious weeds may be grubbed or controlled with chemicals, provided the control can be effected without seriously impairing wilderness values (BLM Wilderness Management Policy- USDI, BLM 1981b). Other vegetation control in designated wilderness areas would only be undertaken as necessary to maintain wilderness character or as allowed under the specific wilderness plan.

Whenever evidence of historic or prehistoric occupation is found during BLM activities, special surveys are undertaken to determine possible conflicts in management objectives. In addition, a Class III (complete) cultural resources inventory is required on all areas to be subjected to ground disturbance. This inventory is conducted in the preplanning stage of an action, and the results are analyzed in an environmental analysis addressing the action (BLM Manual 8100, Cultural Resource Management). When a cultural resource that might be harmed is discovered during weed treatment, nearby operations are immediately suspended and may resume only upon receipt of written instructions from the BLM authorized officer. Procedures under the California Statewide Programmatic Memorandum of Agreement and/or, 36 CFR 800 would be followed, including consultation with the State Historic Preservation Officer in determining eligibility for nomination to the National Register of Historic Places, effect, and adverse effects.

CHEMICAL METHODS

The use of chemicals to control plant growth has been demonstrated to be an effective technique in certain situations and with proper application. The specific plant, stage of plant growth, and season of application are especially important in prescribing chemical (herbicide) treatments as proposed by Alternatives 1 and 2. Plant susceptibility to herbicides varies seasonally and widely throughout the EIS area. Information on the most effective timing of applications appears in published research and on herbicide labels.

While this EIS will cover specifically the use of 16 herbicides, others have been proposed or may be proposed in the future, for use by private parties on their mining claims, leases or rights-of-way. Chemicals other than the 16 covered herein will not be allowed for use on public lands until risk assessments can be prepared for those chemicals. The use of paraquat for Cannabis eradication has been addressed by such a risk

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assessment by DEA 1985 and, in accordance with 40 CFR 1502.21, that EIS is adopted by reference.

All proposals for herbicide use must have an approved pesticide use permit. This permit is signed by the State Director or Director depending on size of treatment and other factors. Through review of the proposal the State Office Pesticide Coordinator will ensure that current regulations, chemical guidance/restrictions, and safety information are utilized.

Since specific herbicides affect plant species differently, it is difficult to state in other than general terms what plants they affect. To determine the specific species affected herbicide labels should be used. For use to control broad leaf plant species without affecting grasses the following herbicides are generally used: 2,4-D, 2,4-DP, dicamba, picloram, and triclopyr. Dalapon is used for control of grasses. Broad spectrum and nonselective herbicides include amitrole, atrazine, bromacil, diuron, glyphosate, hexazinone, and tebuthiuron. Simazine is used on aquatic species. Fosamine is used to control woody vegetation, while ferns are controlled with asulam.

Information on herbicides proposed for use is presented in Table 1-2. More detailed information can be found in Appendix F, on herbicide labels, or in the following documents: Pesticides Background Statement (USDA, FS 1984), Supplement to the Western Oregon Program - Management of Competing Vegetation (USDI, BLM 1986), Herbicide Handbook of the Weed Society of America, 5th Edition, 1983, and Agricultural Chemicals Book II Herbicides (Thomson 1983). Herbicides would be applied and monitored in accordance with BLM Manual 9222, Chemical Pest Control, and in accordance with the herbicide label. Safety considerations and personal protective equipment recommended by the Material Safety and Health Data Sheet for each herbicide will be followed.

Herbicide formulations have been evaluated in order that use of products with inert ingredients of toxicological concern is avoided if possible. EPA lists inert chemicals by level of toxicological concern. EPA's Lists 1 and 2 are those which are known to be hazardous, or suspected of being hazardous. Lists 3 and 4 contain chemicals which have no evidence of toxicity concern or are recognized as safe. Those products discussed in Table 1-2, and more specifically in H-6, were screened to ensure that only brands with inerts which are not on either of EPA's lists of concern (Lists 1 and 2) are proposed for use. For a couple of herbicides, brands which contain a petroleum distillate of concern have been listed and are further addressed within Appendix H.

Herbicides are applied in several ways, depending upon the treatment objective, topography of the treatment area, target species, expected costs, equipment limitations, and potential environmental impacts.

Herbicide applications would be timed to have the least impact on nontarget plants and animals consistent with the objective of the vegetation control program. Table 1-3 shows the types of treatment and estimated acreage proposed by plant communities within the EIS area.

Rates of herbicide application would depend on the target species, other vegetation present, soil type, depth of the ground water table, and

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Table 1-2

Estimated Annual Acreage of Chemical Treatment by Method and Herbicide[1]

Herbicide	Major[2] Trade Name	Expected[3] Rate of Application	Estimated Annual Acreage	
			Proposed Action Alt. 1	No Aerial Alt. 2
Helicopter or Fixed-Wing				
2,4-D amine salt or butyl ester	Esteron, DMA	2.5 lbs. ai/acre	3,500	0
Picloram[4]	Tordon	1 lb. ai/acre	700	0
Triclopyr	Garlon	2 lbs. ai/acre	600	0
Hexazinone	Velpar, Pronone	2.5 lbs. ai/acre	280	0
Atrazine	Aatrex, Drexel Atrazine	3.75 lbs. ai/acre	120	0
Ground Vehicle				
Glyphosate	Rodeo	2 lbs. ai/acre	100	100
2,4-D amine salt or butyl ester		2.5 lbs. ai/acre	100	100
Picloram[4]	Tordon	1 lb. ai/acre	100	100
Hexazinone	Velpar, Pronone	2.5 lbs. ai/acre	50	50
Triclopyr	Garlon	2 lbs. ai/acre	50	50
Tebuthiuron	Spike	2.2 lbs. ai/acre	100	100
Diuron	Drexel Diuron	4 lbs. ai/acre	50	50
Amitrole[5]	Amino Triazole	2 lbs. ai/acre	50	50
Dicamba	Banvel	1 lbs. ai/acre	100	100
Dalapon[4]	Dowpon	4 lbs. ai/acre	100	100
Ground Hand				
Picloram[4]	Tordon	1 lb. ai/acre	240	290
Glyphosate	Rodeo	1.5 lbs. ai/acre	150	150
Triclopyr	Garlon	2 lbs. ai/acre	150	200
Dalapon[4]	Dowpon	4 lbs. ai/acre	50	50
Dicamba	Banvel	1 lbs. ai/acre	50	50
Hexazinone	Velpar, Pronone	1.12 lbs. ai/acre	50	50
2,4-D	Esteron, DMA	2 lbs. ai/acre	50	200
Atrazine	Aatrex, Drexel Atrazine	3 lbs. ai/acre	10	10
Tebuthiuron	Spike	1.5 lbs. ai/acre	50	50
Asulam	Asulox	1.2 lbs. ai/acre	20	20
Bromacil	Hyvar X	4 lbs. ai/acre	20	20
Simazine	Princep	2 lbs. ai/acre	20	20
Fosamine[4]	Krenite	3 lbs. ai/acre	20	20
2,4-DP	Weedone 2,4-DP	2 lbs. ai/acre	20	20

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[1] Liquids would be applied using water as the carrier.

[2] See specific formulations proposed for use in Table H-6.

[3] Expected application rates that would be used, actual application rates may be less.
ai = active ingredient.

[4] Registration for these herbicides has not been renewed in California. Existing supplies may be sold and used for two years, after that these herbicides may not be used in California. Dalapon's registration has been dropped nationwide.

[5] Amitrole has recently been listed as a carcinogen on the list of chemicals developed under the California Safe Drinking Water and Toxics Enforcement Act of 1986. Use of Amitrole may be subject to special procedures or restrictions due to this Act.

Table 1-3

Proposed Treatments by Plant Community

Affected Plant Community	Treatment Method	Annual Acreage			Purpose
		Alt. 1	Alt. 2	Alt. 3	
Chaparral	Aerial Spraying	1700	0	0	Prescribed Burn Pretreatment
Sagebrush	Aerial Spraying	2900	0	0	Range Improvement
Yellow Pine Forest	Aerial Spraying	200	0	0	Forest Management
Mixed Evergreen Forest	Aerial Spraying	400	0	0	Forest Management
Sagebrush	Ground Vehicle	50	50	0	Noxious Weeds, ROWs
Valley Grassland & Woodland	Ground Vehicle	630	630	0	Noxious Weeds, ROWs
Desert Scrub	Ground Vehicle	20	20	0	Noxious Weeds, ROWs
Yellow Pine Forest	Ground Vehicle	50	50	0	Forest Management
Mixed Evergreen Forest	Ground Vehicle	50	50	0	Forest Management
Sagebrush	Ground Hand	50	50	0	Noxious Weeds, ROWs
Valley Grassland & Woodland	Ground Hand	500	500	0	Noxious Weeds, ROWs
Yellow Pine Forest	Ground Hand	50	100	0	Forest Management
Mixed Evergreen Forest	Ground Hand	150	350	0	Forest Management
Desert Riparian	Ground Hand	150	150	0	Tamarisk Removal
Yellow Pine Forest	Manual	195	195	250	Forest Management
Juniper Woodland	Manual	200	200	200	Range Improvement
Desert Riparian	Manual	25	25	50	Tamarisk Removal
Valley Grassland & Woodland	Manual	30	30	400	ROWs, Oil and Gas Fields
Mixed Evergreen Forest	Manual	50	50	300	Forest Management
Chaparral	Mechanical	1,425	1,425	1,650	Prescribed Burn Pretreatment
Valley Grassland & Woodland	Mechanical	400	400	600	ROWs, Oil and Gas Fields
Alkali Sink	Mechanical	100	100	100	ROWs, Oil and Gas Fields
Yellow Pine Forest	Mechanical	400	500	500	Forest Management
Mixed Evergreen Forest	Mechanical	75	75	100	Forest Management
Sagebrush	Mechanical	0	300	400	Range Improvement
Chaparral	Prescribed Burn	14,900	14,900	14,900	Fuel Reduction, Wildlife Habitat Improvement
Sagebrush	Prescribed Burn	11,000	11,000	11,000	Range Improvement
Mixed Evergreen Forest	Prescribed Burn	100	100	100	Forest Management
Total		35,800	31,250	30,550	

presence of other water sources. Where weeds have infested riparian areas and woody draws, the rate of application would be reduced to reduce injury to nontarget species.

Aerial applications could be done by either helicopters or fixed-wing aircraft, and nozzles to reduce drift would be used for all liquid applications. Liquid herbicides would not be applied when wind speeds exceed 5 miles per hour (mph), and granular herbicides would not be applied when wind speeds exceed 10 mph. Herbicides would not be applied when conditions stated on the herbicide label cannot be met and when air turbulence significantly affects the desired spray pattern. Buffer zones (see Glossary) to protect water resources would be developed individually for each project proposal based on site characteristics and values and any appropriate local or State requirements.

Vehicle-mounted sprayer (handgun or boom) applications would be mainly used in open areas that are readily accessible by vehicle. The boom would be used only where feasible to treat concentrated weed infestations and to clear undesirable vegetation, as in tree plantations and conifer release. The handgun would be used for spot treatment of weeds and no closer than the high-water line near water bodies. Neither handguns nor booms would be used in riparian areas where weeds are closely intermingled with shrubs and trees. Under both handgun and boom methods, sprays would be applied at a height of 1.5 to 2 feet when wind velocity is below 8 mph, except in riparian areas where treatment would be applied only at wind velocities below 5 mph. Boom sprayers would not be used within 25 feet of water bodies.

Hand applications could involve backpack spraying, spotgun application, wiper application, and cyclone broadcast spreading (granular formulations) to control target grasses, forbs, brush, and trees. Backpack sprayers are operated at low pressure and low volume and release herbicide through a single nozzle held from 0.5 to 2.5 feet above the ground when wind velocities do not exceed 8 mph. (Near water, wind velocities cannot exceed 4 mph.) Contact systemic herbicides (see Glossary), wiped on individual plants, would be used no closer to water than the existing high-water line. Granular formulations would be applied through broadcast spreaders at about 3.5 feet above the ground and no closer than 10 feet from the high-water line of streams and other water bodies.

Another hand application technique used for control of undesirable trees and brush, especially tamarisk in the desert, involves the complete or partial cutting of the trunk and application of herbicide to the cut portion of the plant. This method is called the cut and squirt and proves to be a very selective herbicide application technique.

MANUAL METHODS

Hand pulling and hand tools (shovel, hoe, pulaski, chainsaws) would be employed under all alternatives (Table 1-1). These methods are highly labor intensive, requiring periodic retreatment, ranging from every three weeks during the growing season to annually, depending on the target species. These methods have been successful in controlling annuals and

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biennials but have shown only limited success in effectively controlling creeping perennials and brush species.

MECHANICAL METHODS

Chaining, crushing, dozing, mowing, and tilling would be used under all alternatives (Table 1-1).

Mechanical methods range from prevention of seed production to total destruction or removal of plants. This method may also weaken nontarget species in treated areas.

PRESCRIBED BURNING

Prescribed burning would be conducted when weather or fuel conditions are favorable and as approved by local air pollution control districts responsible for smoke management. Burning permits will be obtained where required. BLM prescribed burns are often coordinated burns with the California Department of Forestry and Fire Protection or other agencies and landowners.

All burning would be conducted in accordance with BLM's Fire Management Policy (BLM Manual 9210), which requires the preparation of a prescribed burning plan before every burn. The prescribed burning plan addresses the following: physical characteristics of the burn area, objectives of the burn, fuels on site (loading and characteristics), weather conditions under which the plan will be carried out, expected fire behavior, air and water quality restrictions, ignition pattern and sequence, emergency fire control force requirements, public contacts, and safety.

Two methods are normally used in igniting prescribed burns. Either ground application, including terratorch, drip torches and fuses, or aerial applications which include helitorch or aerial ignition device systems are used to ignite fires. The terratorch is the use of truck-mounted propane flamethrowers. Drip torches are used to apply a burning mixture of diesel fuel and gasoline by hand. Hand-held fusees are similar to flares and are touched directly to the vegetation to ignite it. The primary method used in California is the helitorch which is an apparatus carried by a helicopter which drops an ignited gel onto the vegetation. Aerial ignition device systems include grenade-type igniters and other aerial launched methods. Whatever method may be used, the burn area is traversed in a specified pattern described in the prescribed burning plan. Tailoring traverse patterns to each burn area can maintain effectiveness, maximum safety, and control.

COMPARISON OF IMPACTS

Table 1-4 compares the impacts of all three alternatives. Although the impacts are described in detail in Chapter 3, Table 1-4 is presented to assist decisionmakers and reviewers by concisely summarizing and comparing the major impacts by alternative.

Table 1-4. Summary of Impacts by Alternative

Resource Value	Existing Situation	Alternative 1 Proposed Action	Alternative 2 No Aerial Herbicides	Alternative 3 No Change/No Herbicides
Air Quality	Air quality in area generally good overall with problems primarily restricted to urban areas.	Moderate, short-term increases in smoke intrusions expected, but standards not expected to be exceeded. Localized fugitive dust expected from manual and mechanical treatments. Some insignificant chemical drift and volatilization from herbicides.	Similar to Alternative 1, except less chemical drift and volatilization, and slightly more dust.	Same as Alternative 1, except no impacts from herbicides and more dust from increased mechanical treatments.
Soils	Great variation of soils in EIS area due to differences in climate, parent material, topography, and vegetation.	Short-term increases in erosion, long-term stabilization. Possible herbicide persistence in arid soils.	Slightly more erosion and less chance of herbicide persistence.	Greater short-term increases in erosion. No herbicide impacts.
Water Resources	Water quality varies throughout the EIS area.	Little chance of detectable levels of herbicides entering streams from drift and spraying in ephemeral channels. Short-term increases in sediment from mechanical and prescribed burn treatments offset by reduction in wildfire impacts.	Less spray drift and no spraying in ephemeral channels, slightly more sediments from more mechanical treatments.	No impacts to water from chemicals. Localized increases in suspended sediments and dissolved solids from mechanical treatments.
Vegetation	Presently desirable vegetation is competing with undesirable plants and/or noxious plants.	Present commercial conifer production would be maintained. Production of grass species would increase. Noxious weeds would be reduced or controlled. Some injury or loss of nontarget vegetation would occur.	Commercial conifer production would decline but to a lesser extent than Alternative 3. Production of grass species would increase but to a lesser extent than under Alternative 1. Noxious weeds would be reduced or controlled. Less injury or loss of nontarget species would occur than under Alternative 1.	Desirable vegetation production would decline. Noxious weeds would be controlled but not to degree desired. Least impact to nontarget plant species.

Table 1-4. Summary of Impacts by Alternative (Cont.)

Resource Value	Existing Situation	Alternative 1 Proposed Action	Alternative 2 No Aerial Herbicides	Alternative 3 No Change/No Herbicides
Timber Sales	Present annual allowable cut of 21.6 million board feet.	Annual Allowable cut maintained at 21.6 million board feet.	Annual allowable cut would decline to 20.5 million board feet.	Annual allowable cut would decrease to 17.3 million board feet.
Woodland Products	Presently there are 866,000 acres of woodlands with juniper woodland yield exceeding demand for products while hardwood demand is greater than the sustained yield.	Little to no impact to juniper woodlands and impacts to hardwoods only from accidental drift or burning. Prescribed burning of chaparral would benefit hardwoods by lessening fire hazard.	Same as Alternative 1 except greatly lessened chance of chemical drift affecting hardwoods.	Same as Alternative 2 with no chance of herbicide effects.
Wildlife	Many different animals with a very diverse variety of habitats on public lands.	Localized beneficial and negative impacts to wildlife habitat and species. Impacts EIS areawide would be insignificant. No significant toxic effects on wildlife from chemicals except for accidental scenarios.	Same as Alternative 1, but fewer beneficial impacts due to inability to pretreat with herbicides for prescribed burning and fewer possible chemical impacts to species.	Same as Alternative 2, but slightly fewer beneficial impacts such as tamarisk eradication.
Livestock and Wild Horses	Forage production is lower than desired due to competition of undesirable plants or noxious weeds.	Desirable forage species for livestock and wild horses would increase. Some shrubs and trees used for shelter would be killed. Negligible impacts would occur from exposure to herbicides.	Impacts similar to Alternative 1, except that the magnitude of forage increase would be less, and no impact to shelter vegetation.	Desirable forage species would decrease due to increased competition from undesirable plants and noxious weeds, where manual and mechanical measures are ineffective.
Cultural Resources		Low possibility of site damage.	Slightly higher possibility of damage than Alternative 1.	Highest possibility of damage.
Visual Resources and Recreation	Wide variety of visual and recreational experiences on public lands.	Slightly negative impacts to visual resources with effective control of undesirable vegetation in recreation sites.	Same as Alternative 1.	Same as Alternative 1, except less control of undesirable vegetation in recreation sites.

Table 1-4. Summary of Impacts by Alternative (Cont.)

Resource Value	Existing Situation	Alternative 1 Proposed Action	Alternative 2 No Aerial Herbicides	Alternative 3 No Change/No Herbicides
Wilderness and Special Areas	Five designated BLM Wilderness Areas and 6.9 million acres of Wilderness Study Areas.	Possible impacts from accidental aerial spraying or drift.	No impacts.	Possible less than adequate control of noxious weeds.
Economic Conditions	Local economies rely on production of public lands and expenditures for vegetation control also support local economies.	Beneficial impacts of continued productivity and control of noxious weeds to eliminate competition with income producing plants. Expenditures for control of vegetation also result in gains to local economies.	Same as Alternative 1, with slightly lowered productivity and less money spent on program and thus lessened local economy.	Lessened public land productivity and more competition between noxious weeds and income producing plants. Lowered long-term economic productivity of public lands.
Social Environment		Beneficial effects due to local economic conditions, with some perceived hazard to social well being due to herbicide use.	Same as Alternative 1, except lessened beneficial gains and lessened perceived herbicide danger.	Negative impact to local economic conditions. No perceived danger from herbicides.
Human Health		No adverse impacts expected from use of herbicides or other control methods.	More workers exposed to herbicides and mechanical equipment accidents.	More workers exposed to accidents from manual and mechanical control activities.

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IMPLEMENTATION

FINAL DECISIONS

Thirty days after the final EIS is published, BLM decisionmakers will evaluate public comment on the draft and final EISs and prepare a record of decision. The decision may be to select one of the alternatives intact or to combine features from several alternatives that fall within the range of actions analyzed in this EIS. The Record of Decision will address significant impacts, alternatives, environmental preferences, and relevant economic and technical considerations.

MONITORING AND STUDIES

Vegetation management treatment contracts are continuously monitored while the work is being done. Prescribed burns are monitored in progress, and the effectiveness of burns is assessed in postburn evaluation reports. Vegetation management at most recreation sites and along roads and hiking trails is routine maintenance work conducted and monitored by Bureau employees.

Impacts of vegetation treatments on other resources would also be monitored. Currently, the California Air Resources Board monitors air quality by measuring particulate levels in the atmosphere. Water quality monitoring would be carried out in accordance with Executive Orders 11514 (partially amended by 11991) and 12088, Sections 208 and 313 of the Clean Water Act, BLM Manual 7240, and basin-specific water quality plans. Additional monitoring systems for other resources (watershed, wildlife, vegetation, etc.), as identified and outlined in the final decision and site-specific EAs, will be developed and implemented (Appendix D). Effectiveness of mitigating measures identified in project-specific environmental documents will be monitored through periodic inspections of selected projects.

REQUIREMENTS FOR FURTHER ENVIRONMENTAL ANALYSIS

This EIS is a programmatic statement for vegetation management on BLM-administered lands in California and northwest Nevada and is intended to guide this program for the next 10 years. Site-specific environmental analysis and documentation will be prepared at the district or resource area level on each proposed site-specific vegetation control plan. During site-specific analysis and documentation, public involvement will occur in accordance with the CEQ Regulations for implementing NEPA. Interdisciplinary impact analyses will be based upon this and other EISs, such as resource management plan, timber management plan, and grazing management plan EISs. Impacts already addressed by this or other BLM EISs will be referenced while site-specific impacts will be identified in the EA.

If analysis finds potential for significant impacts not already described in an existing EIS, another EIS or a supplement to an existing EIS may be required. Site-specific mitigations, project stipulations, and monitoring needs will be determined through the EA process.

INTERRELATIONSHIPS

The scattered nature of BLM-administered land in the EIS area makes it essential for BLM to coordinate its management activities with adjacent landowners and managers. BLM also works closely with other government agencies responsible for special resource management programs. This section briefly describes major interrelationships involved in the vegetation control program.

Federal Government

BLM shares common boundaries with several national forests and routinely coordinates with Forest Service supervisors and staffs. Specific project and program coordination takes place as needed between all management levels of each agency. The Forest Service Region 5 is a cooperator with BLM on this EIS in order that they can later document the chemical hazard portion of this EIS, but the impact analysis does not assess any proposed treatments of the Forest Service.

The U.S. Environmental Protection Agency (EPA) has responsibility for herbicide registration (40 CFR 162), including determining that a herbicide will not generally cause unreasonable adverse effects on the environment. EPA's determinations are based upon research data supplied by the applicant for registration.

The U.S. Fish and Wildlife Service administers the Endangered Species Act of 1973 (PL 93-205), as amended. Accordingly, BLM consults with that agency when it is determined that a federally listed or proposed threatened or endangered species or its critical habitat may be affected. The purpose of consultation is to avoid adverse impacts to the species in question. Such consultation may result in modification or abandonment of an action.

The National Park Service (NPS) administers the Nationwide Rivers Inventory, as provided under the National Wild and Scenic Rivers Act of 1968 (PL 90-542). Present efforts are directed toward inventory and evaluation to determine which free-flowing rivers and river segments are suitable for possible designation as components of the National Wild and Scenic Rivers System. BLM consultation with NPS is required if proposed management actions could alter a river's ability to meet established Wild and Scenic Rivers Act eligibility, classification criteria, or both. BLM also shares common boundaries with several national parks and monuments and routinely coordinates with Park Service management.

Tribal governments will be consulted when vegetation is controlled along the common boundaries between BLM and Indian trust lands. Consultation with potentially concerned Native American tribal groups and organizations will be undertaken as an aspect of the site-specific EAs (to be done after this programmatic EIS) consistent with BLM Manual Supplement 8100 Rel. 8-1 and the MOU among BLM, NAHC, and the California SHPO.

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State and Local Governments

Section 202(c)(9) of the Federal Land Policy and Management Act requires BLM to develop resource management programs consistent with those of State and local governments to the extent that such BLM programs are also consistent with Federal law and regulations. BLM coordination efforts involve a number of State and local agencies as described below.

Section 202(c)(8) of the Federal Land Policy and Management Act requires BLM to provide for compliance with applicable pollution control laws, including State and Federal air and water pollution standards or implementation plans.

Permittees and grantees operating within rights-of-way on BLM-administered lands are required to comply with Department of the Interior herbicide regulations.

California

The Office of Planning and Research for the State of California is the clearinghouse for State agencies to which BLM provides notices of all its major proposed actions for coordinated State-level review. BLM has notified the clearinghouse of plans to prepare this EIS and will provide copies of the EIS for the State review as provided for by the MOU between BLM and the clearinghouse.

BLM has established relations with the California State Department of Food and Agriculture to ensure cooperation and coordination in noxious weed control and eradication efforts. BLM districts coordinate on a project-specific basis with the individual county agricultural commissioners. The Department of Food and Agriculture also has regulatory responsibility over herbicide use within the State.

The California Department of Fish and Game (CDF&G) has the responsibility for managing California's wildlife and fish. In managing lands under its jurisdiction, BLM considers wildlife habitat as a resource category. The Sikes Act (PL 93-452), as amended, is the main tool guiding coordination between BLM and CDF&G. Cooperative agreements and memorandums of understanding describe the responsibilities of the two agencies. Actions possibly affecting State listed threatened and endangered species are also coordinated through CDF&G.

To comply with the Clean Air Act Amendments of 1977 (PL 95-95), as amended, BLM cooperates with the local Air Pollution Control Districts (APCD). The main objective is to keep smoke from prescribed fires away from population centers and other smoke-sensitive areas. Burning is allowed only when smoke dispersion conditions are determined to be favorable by the APCDs.

The California State Water Resources Control Board through the Regional Water Quality Control Boards has lead responsibility for statewide water quality management planning in accordance with Section 208 of the Federal Water Pollution Control Act (PL 92-500), as amended by the Clean Water Act (PL 95-217) and the BLM management practices are designed to meet or exceed objectives of the statewide water quality management plan.

In 1986 California voters passed the Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) which required listing of known carcinogens and reproductive toxicants. As written the law does not pertain to Federal agencies, however there has been pressure to include the Federal government within the law. Presently only one of the proposed herbicides, amitrole, has been identified under the Proposition 65 process. If required by changes within the law or based on legal interpretations BLM will comply with Proposition 65, otherwise notification procedures outlined within the EIS will be followed for amitrole or any other herbicide listed at a later date.

The California Department of Forestry and Fire Protection (CDF) has responsibility for administering the State's Chaparral Management Program and other prescribed burn programs throughout the State on non-Federal lands. BLM and CDF are signatories, along with several other state and Federal agencies, of a MOU on Coordinated Resource Management Planning, a program under which many interagency prescribed burns are presently conducted.

Nevada

The Nevada State Clearinghouse was notified of the development of the EIS and will be provided copies of the EIS for coordination of State agency review. BLM also will coordinate with the Nevada agencies affected by BLM's on-the-ground actions. These agencies would include the Department of Wildlife and the State and County Agricultural Commissions.

Private Landowners

Because private landowners are highly interested in BLM operations near their land, BLM strives to keep these landowners informed about its operations. Before preparing environmental documents at the state, district, or resource area level, BLM invites interested landowners to comment on proposed programs. Before aerial application of herbicides, BLM informs local newspapers and all residents and contiguous landowners within a half-mile of spray sites.

CHAPTER 2

AFFECTED ENVIRONMENT

BEST COPY AVAILABLE

CHAPTER 2

AFFECTED ENVIRONMENT

CLIMATE AND AIR QUALITY

The climate of the EIS area varies from mediterranean for most of the area, to steppe in scattered foothill and inland basin areas, to alpine in the high Sierra, to desert in the Colorado and Mojave Deserts.

The Pacific Ocean and its maritime air masses have a heavy influence on the climate. The effect of abrupt changes in topography on temperature range, wind velocity, and precipitation amount and frequency results in wide variations often within a few miles. The Sierra Nevada and the Cascade Range effectively act as barriers for the movement of continental air masses from the east.

Two of the usual four seasons dominate the EIS area: a dry, warm summer and a cool, wet winter season. Winter lasts from October to April in the north and from November to March in the southern portion.

Winter storms from the west bring precipitation which falls as rain in the valleys and foothills and as snow in the mountains. Precipitation increases from south to north and falls heaviest on the west side of the mountains. When the snowpack melts in the spring, the heaviest runoff descends the west side of the mountains. Eastern mountain slopes fall into typical "rain shadows."

Snow is the major form of precipitation in high, forested, mountainous areas. It can be expected in the Sierra Nevada at any elevation above 2,000 feet during October to May. Above 4,000 feet, snow will remain on the ground for long periods of time, and at even higher elevations will be present all winter.

Air quality problems in some parts of the EIS area are unique and more severe than those found in any other portion of the country. Some of the most predominant air quality problems are caused by photochemical pollutants, created by reaction of directly emitted pollutants to ultraviolet sunlight.

The EIS area's air quality is affected by population, the types and number of pollutant sources, weather conditions and geography, all of which vary considerably from one region of the area to another. Generally, air quality is best in areas with low population density, such as rural areas of Northern California, and in mountainous regions at elevations higher than most commonly occurring temperature inversions.

Air quality is poorest in metropolitan areas and in locations downwind of them. Downwind locations often experience the worst air quality since local sources contribute to pollutant problems generated by sources elsewhere.

Various pollutants reach their peak concentrations during different times of the year. Concentrations of oxidant, sulfate and other pollutants that are the result of atmospheric photochemical reaction peak during the summer months. Concentrations of pollutants that are not formed photochemically, such as lead or carbon monoxide, are highest in winter months.

The predominant air quality problem in California's central valleys is excessive concentrations of particulate matter. In the San Joaquin Valley, annual average concentrations of particulate are double the State's air quality standards and are influenced primarily by agricultural operations.

Although air quality problems exist in urban areas such as Los Angeles and Riverside, the air quality in the EIS area is generally good overall.

There are provisions in the Clean Air Act Amendments of 1977 to ensure that air quality does not deteriorate in areas with clean air. Class I areas such as national parks and wilderness areas, allow virtually no deterioration. Most of the EIS area is Class II, which allows moderate deterioration of air quality.

GEOLOGY AND TOPOGRAPHY

The EIS area can be divided into fairly distinct geomorphic provinces dependent upon the geologic and climatic history of each area (Oakeshott 1971). The Sierra Nevada is a huge granitic mountain range on the area's eastern side, which has a gently sloping western slope, while the sheer eastern face drops off abruptly. The Central Valley lies on the western side of the Sierra Nevada, a vast sedimentary alluvial plain which is the drainage basin for most of California's rivers flowing out of the mountains. On the eastern side of the Sierras, the basin-ranges form an area of parallel mountains and basins experiencing harsher climatic extremes.

The northern portion of the EIS area is composed of the Klamath Mountains, the Cascade Range, and the Modoc Plateau. The Cascades are a chain of volcanic cones dominated by Mount Shasta at an elevation of 14,162 feet. The Modoc Plateau is an interior draining platform consisting of a thick accumulation of lava flows and tuff beds with many small volcanic cones. Along the California border with the Pacific Ocean are a series of more or less parallel mountain ranges and valleys which compose the Coast Ranges. Many active fault zones, including the San Andreas Fault, occur throughout the length of these ranges.

In the southern portion of the EIS area, the Transverse Ranges are distinguished by a strong east-west trend in contrast to the north-south pattern of all other geomorphic regions. This area is also a series of ranges and valleys running parallel away from the coast. California's southernmost mountains are the Peninsular Ranges with a geological profile like the granitic Sierra Nevada, but a topography similar to the Coast Ranges. A low-lying basin, the Colorado Desert, is directly east of these ranges. Part of the desert lies below sea level. The Mojave Desert stretches across the southeastern part of California, a vast area of isolated mountains separated by expanses of dry plains.

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More detailed geologic and topographic information may be obtained from BLM State, District, and Resource Area Offices in the EIS area.

SOILS

Soil development is a function of the parent material, slope, climate and plant cover over time. These factors of soil formation have produced a myriad of different soils. The soils in the EIS area are highly variable in depth, texture, stoniness, chemical and physical properties. This broad range of characteristics implies a wide variation in drainage, permeability, erodibility, inherent fertility, water-holding capacity and any other soil property that is important to nutrient cycling and decomposition of organic compounds such as herbicides.

Soil surveys have been completed, are under way, or are planned on most BLM lands in the EIS area. This soil information is on file at BLM and Soil Conservation Service Offices throughout the EIS area.

WATER RESOURCES

SURFACE WATER

The BLM lands of the EIS area contribute to the flow of all the major rivers in California, but more directly affect the flow of ephemeral, intermittent, and small perennial creeks and rivers. These smaller streams flow both into major rivers and into closed basins such as the desert basins, Eagle Lake, Honey Lake, and Owens Valley. Many small springs and seeps important for wildlife and livestock are also found on the public lands.

Surface water is an important resource throughout the EIS area. Large amounts are used by municipal, domestic, agricultural, and industrial users. Nonconsumptive uses include uses for fisheries, recreation, aesthetics, hydropower generation, transportation, and water quality maintenance. BLM-administered lands contribute to or lie within many watersheds important for municipal supplies. While water contributed to the total flow of the area is relatively small it is often very important for maintaining natural systems for wildlife and aesthetic purposes.

Water quality and the beneficial uses of water are protected by Federal statutes and Executive Orders, State statutes, and agency regulations and directives developed to implement this body of law.

The State Water Resources Control Board and Regional Water Quality Control Boards are responsible for establishing water quality standards/objectives which protect the beneficial uses of different waters from adverse effects by any point discharge as well as nonpoint discharges (through Best Management Practices) into State waters.

The Bureau of Land Management (BLM) is required by Public Law 92-500 and Executive Order 12088 to meet State water quality standards regardless of the management activity. Even where no water quality standards have been

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established by a State, Federal law mandates that the BLM conduct management activities in such a manner as to protect or enhance water quality. Best Management Practices (BMP) would be applied to vegetation management activities to protect water quality on a site-by-site basis as part of each individual project plan.

GROUNDWATER

Groundwater quantity and quality in the EIS area vary greatly and are normally a direct product of the geologic formation in which the groundwater originates. There are about 500 groundwater basins within the EIS area. The best aquifers are found in alluvial deposits along major streams. The following present and/or potential groundwater quality problems have been identified by the staff of the nine State Regional Water Quality Control Boards: salt water intrusion; salt accumulation; overdraft; general chemical problems; industrial chemicals; agricultural chemicals; and metals (SWRCB 1982).

Groundwater basins underlying significant areas of public land are often minimally developed for groundwater use due to their distance from high use areas or because of the yield or quality characteristics of the aquifer. The recharge area of many of the aquifers underlying BLM land is often in nonpublic land areas, i.e., National Forest lands or alluvial deposits under privately owned lands. The quality usually reflects the natural situation as most aquifers under BLM lands are unimpacted by the heavy uses which normally result in degraded groundwater water quality.

VEGETATION

TERRESTRIAL VEGETATION

The assemblage of vegetation communities present in California and northwestern Nevada is complex. This is due in large part to the diverse topography of the immense land area and the wide spectrum of climatic conditions to which it is subject. The EIS area ranges from the redwood belt of the north coast to the expansive deserts of southern California. The plant communities found over this broad range present an array of problems for managing competing vegetation and controlling undesirable plant species. This section will briefly describe the EIS area by land resource regions and major land resource areas (USDA, SCS 1981). Major land resource regions are shown in Figure 2-1. The relationship of plant communities to the various regions and areas can be found in Table 2-1. Appendix I contains the scientific name equivalents of the common names listed below.

Northwestern Forest, Forage and Speciality Crop Region

This region is best described as steep mountains with narrow to broad gently sloping valleys. It supports forests, open forest and grassland vegetation. Public lands in the region occur within two major land resource areas (MLRAs): California Coastal Redwood Belt and Siskiyou-Trinity Area. Dominant tree species include redwood, Douglas-fir, grand fir, white fir, red fir, lodgepole pine, ponderosa pine, sugar pine,

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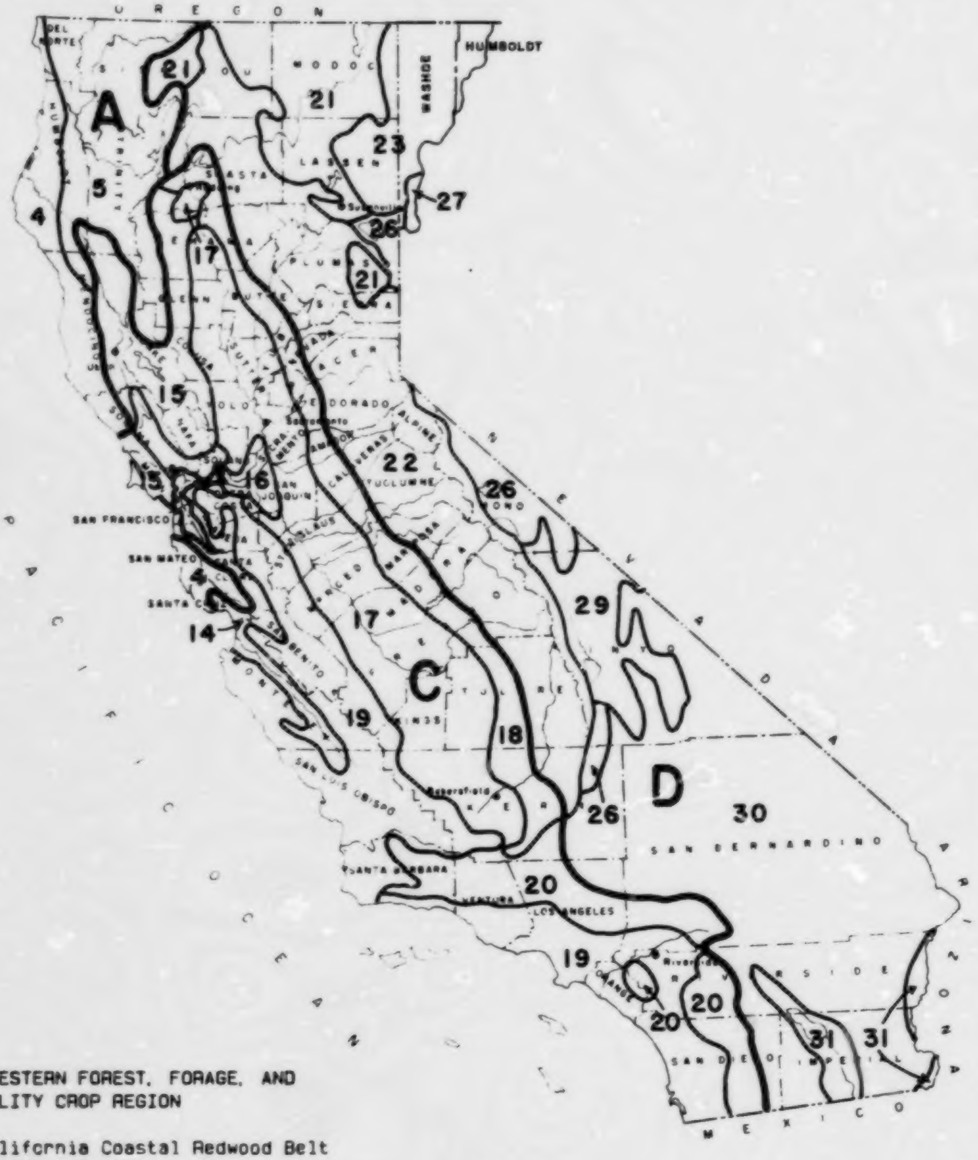
Figure 2-1

LAND RESOURCE REGIONS and MAJOR LAND RESOURCE AREAS


OREGON
DEL NORTE
SISKIYOU
MODOC
HUMBOLDT
WASHOE
A
21
21
23
LASSEN
27
26
5
4
SHASTA
17
PLUMAS
21
SIERRA
15
YOLO
EL DORADO
Sacramento
ALPINE
22
TUOLUMNE
16
15
26
MONO
SAN FRANCISCO
SAN MATEO
SANTA CRUZ
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SAN BENITO
MONTEREY
19
KINGS
TULARE
18
SAN LUIS OBISPO
Bakersfield
KERN
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D
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SAN BERNARDINO
SANTA BARBARA
VENTURA
20
LOS ANGELES
19
ORANGE
Riverside
RIVERSIDE
20
20
31
31
SAN DIEGO
IMPERIAL
MEXICO
NEVADA
ARIZONA
PACIFIC OCEAN

A NORTHWESTERN FOREST, FORAGE, AND SPECIALITY CROP REGION

4	California Coastal Redwood Belt
5	Siskiyou-Trinity Area

C CALIFORNIA SUBTROPICAL FRUIT, TRUCK, AND SPECIALTY CROP REGION

14	Central California Coastal Valleys
15	Central California Coast Range
16	California Delta
17	Sacramento and San Joaquin Valleys
18	Sierra Nevada Foothills
19	Southern California Coastal Plain
20	Southern California Mountains

D WESTERN RANGE AND IRRIGATED REGION

21	Klamath and Shasta Valleys and Basins
22	Sierra Nevada Range
23	Malheur High Plateau
26	Carson Basin and Mountains
27	Fallon-Lovelock Area
29	Southern Nevada Basin and Range
30	Sonoran Basin and Range
31	Imperial Valley

SOURCE: U.S.D.A., SOIL CONSERVATION SERVICE
AGRICULTURE HANDBOOK 296

Table 2-1

Relationship of Vegetation Types* and Plant Communities* to Land Resource Regions and Major Land Resource Areas

Land Resource Region	Vegetation Type	Plant Communities	Major Land Resource Area
Northwestern Forest, Forage and Specialty Crop Region	Strand	Coastal Strand	California Coastal Redwood Belt
	Scrub	Northern Coastal Scrub	California Coastal Redwood Belt
	Coniferous Forest	North Coastal Coniferous Forest	California Coastal Redwood Belt
		Redwood Forest	California Coastal Redwood Belt
		Douglas-fir Forest	California Coastal Redwood Belt/Siskiyou Trinity Area
		Yellow Pine Forest	Siskiyou Trinity Area
		Red Fir Forest	Siskiyou Trinity Area
		Lodgepole Forest	Siskiyou Trinity Area
	Mixed Evergreen Forest	Mixed Evergreen Forest	California Coastal Redwood Belt
	Grassland	California Coastal Prairie	California Coastal Redwood Belt
California Subtropical Fruit, Truck and Speciality Crop Region	Scrub	Alkali Sink	Sacramento and San Joaquin Valleys
	Coniferous Forest	Yellow Pine Forest	Sierra Nevada Foothills
	Woodland-Savanna	Northern Oak Woodland	Central California Coast Range
		Foothill Woodland	Central California Coast Range/Sierra Nevada Foothills
	Chaparral	Chaparral	Central California Coast Range/Sierra Nevada Foothills
	Grassland	Valley Grassland	Central California Coast Range/Sacramento and San Joaquin Valleys
Western Range and Irrigated Region	Scrub	Sagebrush Scrub	Klamath & Shasta Valleys & Basins/Malheur High Plateau/Carson Basin & Mts.
		Shadscale Scrub	Southern Nevada Basin and Range/Sonoran Basin and Range
		Creosote Bush Scrub	Southern Nevada Basin and Range/Sonoran Basin and Range
		Alkali Sink	Southern Nevada Basin & Range/Sonoran Basin & Range/Carson Basin & Mts.
	Coniferous Forest	Yellow Pine Forest	Sierra Nevada Range/Klamath & Shasta Valleys & Basins
	Desert Woodlands	Northern Juniper Woodland	Malheur High Plateau
		Pinyon-Juniper Woodland	Southern Nevada Basin & Range/Sonoran Basin & Range/Carson Basin & Mts.
		Joshua Tree Woodland	Southern Nevada Basin and Range/Sonoran Basin and Range

*(Munz and Keck, 1959)

western red cedar, incense cedar, alder, California bay, chinquapin, madrone, tanoak, Oregon white oak, California black oak, and canyon live oak. Characterizing the forest understory are poison-oak, snowberry, ceanothus and manzanita. California oat grass, blue wildrye, bluegrasses, tufted hairgrass, velvet grass, western and Idaho fescues, and native and introduced bentgrasses are common perennial grasses. Important naturalized annuals include soft chess and other bromes, fescues, filaree, wild oats, and clovers. Typical vegetation management actions within this region are timber management site preparation, release of commercial species (i.e., hardwood suppression), precommercial thinning and stump treatments.

California Subtropical Fruit, Truck, and Speciality Crop Region

This region is characterized by low mountains and broad valleys with long, warm growing seasons and relatively low precipitation. Containing from small to moderate amounts of public land are three MLRAs: Sierra Nevada Foothills, Central California Coast Range, and Sacramento and San Joaquin Valleys.

The EIS area within the region is comprised of forests, oak woodlands, brushlands, and naturalized annual grasslands. Public land forests within the region are restricted to the Sierra Nevada Foothill MLRA. Dominant species include Douglas-fir and ponderosa pine with incense cedar often occurring as a subdominant. Some hardwoods such as California black oak, canyon live oak and big-leaf maple also occur. Beneath the forest canopy, poison-oak is frequently abundant.

Brushland sites are dominated by chamise, manzanita, ceanothus and poison-oak. Scrub oak, coyote brush and California sagebrush are also found on scrubby sites but are most common within the Central California Coast Range and Southern California Coastal Plain MLRAs. Soft chess, bromes, fescues, wild oats, wild barley, filaree and burclover characterize the naturalized annual grassland. Common oak woodland overstory species are blue oak, live oak and digger pine. The ground cover of the oak woodland is very similar, if not identical to the naturalized annual grassland. Saltgrass, iodine-bush and various species of saltbush occur along the valley floor on saline-sodic sites, especially in the southern San Joaquin Valley.

Vegetation control treatments common within the region are: prescribed burning of brushlands; removal of vegetation near geothermal and oil and gas well pads, drilling sites, power plants, and rights-of-way; eradication of noxious weed species; and timber management practices previously described.

Western Range and Irrigated Region

With the exception of the Sierra Nevada Range MLRA, this region can be typified as arid semidesert and desert comprised of plateaus, plains, basins and isolated mountain ranges. Public land acreage within the southeastern portion of the region is extensive. The EIS area includes the following MLRAs: Klamath and Shasta Valleys and Basins, Sierra Nevada Range, Malheur High Plateau, Carson Basin and Range, and Sonoran Basin and Range. Public land forests within the region are found within the Sierra Nevada Range MLRA. Dominant tree species include ponderosa pine, incense cedar, sugar pine, white fir, red fir, lodgepole pine, mountain hemlock,

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California black oak, Oregon white oak, canyon live oak, and tanoak. Sagebrush, blue wildrye, fescues, bluegrasses and mountain brome occur as ground cover below the forest canopy. Vegetation control measures utilized in this area are analogous to those discussed previously for timber management.

Comprising a portion of the public land of northeastern California and northwestern Nevada is the Malheur High Plateau MLRA. The area can be characterized as sagebrush scrub. Big sagebrush, bitterbrush, rabbitbrush, squirreltail, bluebunch wheatgrass, Great Basin wildrye, and needlegrasses dominate the area. Spiny hopsage and bud sagebrush dominate the drier sites. Greasewood, saltbush and saltgrass are found where soil salinity or alkalinity is elevated. Silver sagebrush is found on moist sites with intermittent water (e.g., playas). Rocky sites support western juniper. Aspen groves are found on the more mesic high elevation sites.

Also occurring in northeastern California are the shrub and grassland associations of the Klamath and Shasta Valleys and Basins MLRA. It is typified by bluegrasses, Idaho fescue, bluebunch wheatgrass, and cheatgrass. Dominant shrubs include sagebrush, rabbitbrush, bitterbrush and mountain mahogany. Western juniper is also common. Ponderosa pine and Douglas fir are found in zones of higher precipitation.

Farther south within the region occurs the Southern Nevada Basin and Range MLRA. The area is basically a shadscale scrub community, which is dominated by saltbush species and greasewood. Associated species include bud sagebrush, gray molly kochia, spiny hopsage, ephedra, dalea, winterfat, horsebrushes, galleta, Indian rice grass, black sagebrush, big sagebrush, black brush, bitterbrush and cliffrose. Shadscale is associated with creosote brush, white bursage, spiny mendora and Joshua tree in warmer locations. Saline soils are dominated by black greasewood. Pinyon-juniper woodlands occupy upland mountain sites.

The Carson Basin and Mountains MLRA is characterized by a sagebrush-grass complex. Common components are bitterbrush, squirreltail, needlegrasses and Indian ricegrass. Typical on mid-mountain slopes are pinyon-juniper woodlands, while at the highest elevations Jeffrey pine, lodgepole pine, red fir, and white fir are found. Drier sites support shadscale. Growing in areas of high concentration are basin wildrye, alkali sacaton, saltgrass, black greasewood, and rabbitbrush.

The Sonora Basin and Range MLRA encompasses the southeastern portion of the State. This area supports plant communities of the Mojave and Colorado deserts. Bursage, Joshua tree, juniper, yucca, cactus, creosote brush and ephedra dominate the perennial flora. Ephemeral forbs and grasses occur during favorable rainfall years. Saline sites are dominated by saltbush, saltgrass, alkali sacaton and iodinebush. Grasses commonly occupying sandy sites include Indian rice grass, desert needlegrass and galleta.

Vegetation control measures typically practiced within the region (exclusive of the Sierra Nevada Range MLRA) include: tamarisk eradication along desert riparian zones; prescribed burning and mechanical treatments of sagebrush scrubland and northern juniper woodlands for rangeland improvement; and herbicide use for control of competing vegetation within sagebrush communities to increase livestock and wildlife forage.

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NOXIOUS WEEDS

Twenty-one Category A and B noxious weed species occur on public lands within the EIS area. Most noxious species are introduced plants which outcompete natives and become quickly established. This establishment can be accelerated due to heavy or overuse of the resource such as grazing. Herbicides were employed for the control of a number of these noxious weeds on 140 acres of public lands in 1985. Manual and mechanical methods have been historically used as well. A list of identified noxious weed species occurring on public land can be found in Appendix B.

WETLANDS AND RIPARIAN AREAS

Wetlands and riparian areas occur along lakes, ponds, marshes, rivers, and streams. They are often inundated by water and normally have saturated or seasonally saturated soil conditions. Common wetland and riparian area plants range from cottonwoods and willows, to sedges, rushes, and cattails. The width of the areas may vary from a few feet along small streams to several hundred feet along major rivers. Because of the presence of moisture and abundant nutrients, wetlands and riparian areas are often the most productive areas of vegetation growth. They are valuable for wildlife habitat. The Bureau has a strong commitment to responsible management of these areas.

In the arid or semiarid lands of the EIS area, wetlands and riparian areas make up a small percent of the total land surface. However, undesirable invasive species (e.g., tamarisk) present a serious problem to the long-term management of these sensitive areas.

THREATENED, ENDANGERED AND SENSITIVE PLANT SPECIES

Presently, eight plant species occurring on public land within the EIS area (reference Table 2-2) (BLM Districts noted on Table 2-2 are delineated on Figure 2-2) are included in the Federal list of species threatened or endangered of extinction (Federal Register, Vol. 50, No. 188, September 1985). Two others have been officially proposed for Federal listing. In addition, 61 State-listed species occur or are suspected to occur on public lands within the EIS area. It is Bureau policy to conserve Federal- and State-listed rare, threatened, or endangered plants and to utilize its authorities in furtherance of the purposes of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.), and similar State laws. The BLM, through its actions and/or decisions, will not jeopardize the continued existence of any Federally listed threatened or endangered plant, nor will it destroy or adversely modify Critical Habitats (as determined by the Fish and Wildlife Service) of any such species.

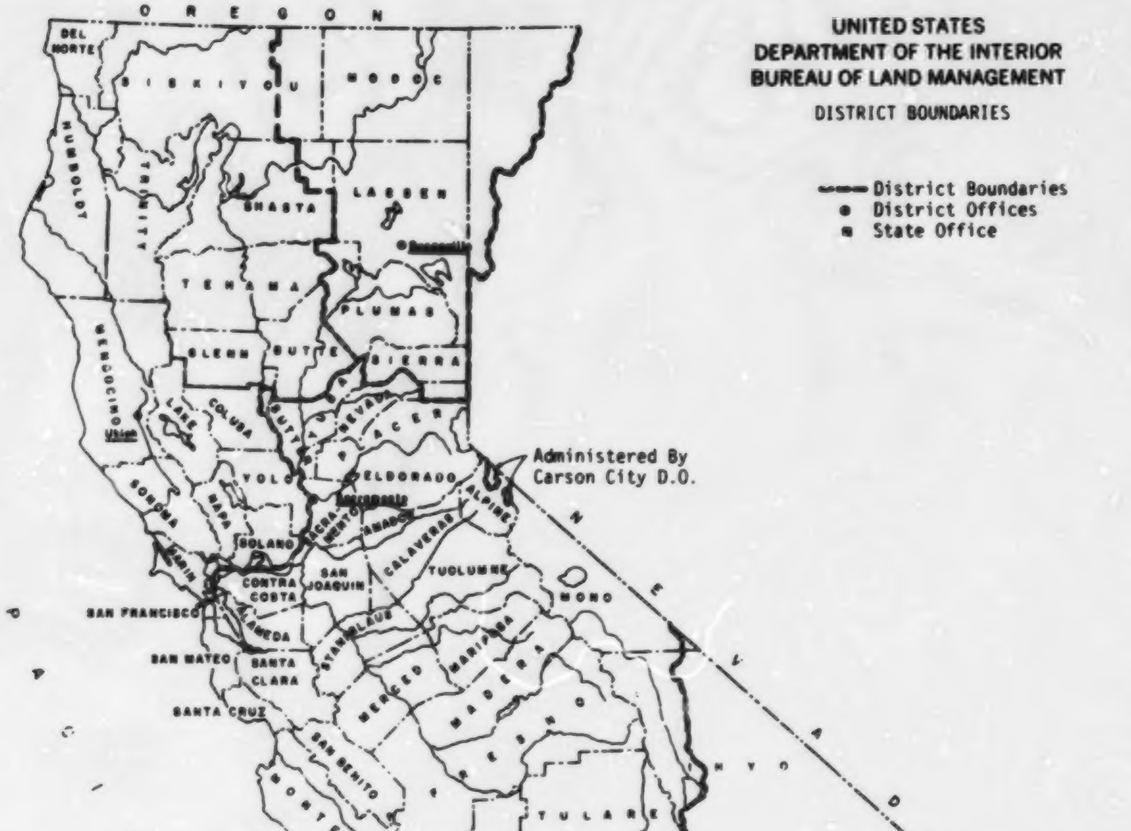
It is also Bureau policy within California to protect sensitive plant species (see Glossary). Pending formal listing, all sensitive plants will be afforded the full protection of ESA unless the State Director judges on a case-by-case basis that evidence against listing a particular plant species is sufficient to allow a specific action. Currently, 148 sensitive plant species occur on public land within the EIS area. Appendix J contains a list of Federal and State-listed plants and sensitive plant species.

Table 2-2

Federally Threatened, Endangered and Proposed Plant Species Within EIS Area

Species	Family	Federal Status	BLM District
Arabis mcdonaldiana Eastw. Mcdonald's rockcress	Brassicaceae	Endangered	Ukiah
Camissonia benitensis Raven San Benito evening-primrose	Onagraceae	Threatened	Bakersfield
Centrostegia leptoceras (Gray) Wats. Slender-horned spineflower	Polygonaceae	Endangered	Calif. Desert
Eriastrum densifolium ssp. *Sanctorum* (Mlkn) Mason Santa Ana River eriastrum	Polemoniaceae	Endangered	Calif. Desert
Grindelia fraxino-pratensis Reveal and Beatley Ash Meadows gum plant	Asteraceae	Threatened	Calif. Desert
Nitrophila mohavensis Munz and Roos Amargosa nitewort	Chenopodiaceae	Endangered	Calif. Desert
Oenothera avita ssp. *eurekensis* (Munz and Roos) Klein Eureka Dunes evening-primrose	Onagraceae	Endangered	Calif. Desert
Swallenia alexandrae (Swallen) Soderstrom and Decker Eureka Dune grass	Poaceae	Endangered	Calif. Desert

Figure 2-2


UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
DISTRICT BOUNDARIES
District Boundaries
District Offices
State Office
OREGON
NEVADA
ARIZONA
MEXICO
PACIFIC OCEAN
DEL NORTE
SISKIYOU
MODOC
HUMBOLDT
TRINITY
SHASTA
LASSEN
Susanville
TEHAMA
PLUMAS
MENDOCINO
Ukiah
GLENN
BUTTE
SIERRA
LAKE
COLUSA
SUTTER
NEVADA
PLACER
YOLO
ELDORADO
Administered By Carson City D.O.
SONOMA
NAPA
Sacramento
SACRAMENTO
AMADOR
ALPINE
SOLANO
MARIN
CONTRA COSTA
SAN JOAQUIN
CALAVERAS
TUOLUMNE
MONO
SAN FRANCISCO
ALAMEDA
STANISLAUS
SAN MATEO
SANTA CLARA
MARIPOSA
MADERA
MERCED
SANTA CRUZ
FRESNO
INYO
SAN BENITO
MONTEREY
TULARE
KINGS
SAN LUIS OBISPO
Bakersfield
KERN
SAN BERNARDINO
SANTA BARBARA
VENTURA
LOS ANGELES
Riverside
RIVERSIDE
ORANGE
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FORESTED AREAS

About 1,023,000 acres of the total 18.6 million acres of Public Domain land in California and northwest Nevada are forested, while 157,000 acres are capable, suitable, and available for commercial timber production. The lands most likely to be affected by vegetation management for forest reestablishment and maintenance are commercial forestlands in northern California.

Under direction from the Federal Land Policy and Management Act of 1976 and other Federal laws, and Sustained Yield Unit Records of Decision, the public domain lands within California currently have an allowable cut of 21.6 million board feet (MBF). Annual sales vary, depending on budgets, market conditions, bidder interest, and size and quality of sale. Harvests have varied even more depending on new housing starts, Congressional extensions to timber sales, and the generally poor timber market during the last several years.

The timber management program for California is documented and described in detail in the Environmental Impact Statements for Sustained Yield Units 8 (King Range) (USDI, BLM 1974) and 13 (Clearlake and Arcata Resource Areas of Ukiah District) (USDI, BLM 1981b) and in the Environmental Assessment for Sustained Yield Unit 15 (Susanville and Bakersfield Districts, Redding Resource Area of the Ukiah District, Carson City District lands in California) (USDI, BLM 1981c).

Since those documents were completed a substantial change in land base as well as the timber stand structure has occurred in SYU 13. The major change which affects treatments proposed in this EIS is that lands acquired as a result of exchanges are largely inadequately stocked and have heavy brush and hardwood stocking levels.

The allowable cut for BLM lands in California is presently 21.6 million board feet per year. This level assumes that intensive forest vegetation management practices will be applied as needed. Without intensive management the allowable cut would have to be reduced by an estimated 25 percent. Intensive management practices include site preparation, planting, plantation maintenance and release, and precommercial thinning but do not include different harvesting methods to ensure natural reproduction.

Forest management plans, EISs, and current practices on BLM forestlands in California emphasize multiple uses of the forestlands. This decision as well as the current stand structure allows cutting practices other than clearcutting in most cases. Cutting practices other than clearcutting especially in the eastside pine type tend to prevent invasion of sites by brush and therefore lessen the need for control of unwanted vegetation.

All-aged as well as even aged management systems are used. The all-aged system is used mainly in the eastside or interior ponderosa/Jeffrey pine type and in areas of special concern (e.g., wild and scenic river corridors, highly erodible soils, harsh sites, etc.). Trees are selected in small groups or individually and are marked for harvest. Regeneration is accomplished mainly by natural means and/or by planting openings and areas disturbed by logging activity.

Even-aged management systems involve stand regeneration done by clearcutting trees (all trees removed from the site), shelterwood, and seed tree methods. Clear cuts are limited in size to 40 acres. Typically clearcuts are between 10 and 12 acres in size. The acreage that requires reforestation each year consists mostly of clearcut sites and areas burned by wildfire.

The four main stages of vegetation management for reforestation are site preparation, planting, release, and precommercial thinning. Under current policy, during the next 10 years a total of about 700 acres would be prepared and planted each year, about 1,000 acres would be released from competing vegetation, and 400 acres would undergo precommercial thinning. Release would occur within 2 to 5 years of planting and precommercial thinning within 10 to 20 years. Some stands may require two release treatments. These practices are explained in detail in Appendix C.

Over many decades most of the forestlands allocated primarily to timber production would tend toward even-aged management. This automatically occurs as clearcuts, fire killed areas, insect and disease infested areas, and brushfields are reforested. Older timber is harvested leaving younger trees which are closer in age. The result is that natural factors as well as harvesting techniques favor the establishment of various groups of even-aged stands varying in size of less than an acre to much larger acreages.

Five major forest types comprise the commercial forestlands within California. Individual areas within extensive stands of each type may vary greatly in vegetative composition, depending on aspect, soil, and other factors.

DOUGLAS-FIR FOREST

This forest type is located in the Coast Range from Mendocino County northward, mostly east of the redwood forest type, and to elevations of 4,500 feet. This type occurs in the Northwestern Forest, Forage and Specialty Crop Region. Average annual rainfall ranges between 30 and 100 inches, and the growing season lasts up to seven months.

Besides Douglas-fir, the principal associated conifers are sugar pine and white fir. The main associated hardwood trees and shrubs are tanoak, madrone, golden chinquapin, big-leaf maple, California black oak, California hazel, deer brush, and snowbrush.

YELLOW PINE FOREST

Eastside Pine

This forest type is found in a nearly continuous belt east of the Cascade and Sierra Nevada Ranges from the Oregon line to the Tehachapi Mountains. South of the Sierra Nevada Range, the type occupies the crests of the higher mountains. This type occurs primarily within the Western Range and Irrigation Region. Precipitation varies from 15 to 40 inches annually. The growing season is only about four months.

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Conifer species are ponderosa pine, Jeffrey pine, white fir, and lodgepole pine. California black oak, junipers, and pinyon pine are sometimes components of this type. The more common associated shrubs include sagebrush, bitterbrush, mountain mahogany, manzanitas, and snowbrush.

Westside Pine

This forest type occurs primarily on the western slopes of the Sierra Nevada and Cascade Ranges as a transition belt of varying width between the foothill woodlands at lower elevations and the mixed conifer forest at higher elevations. This type occurs primarily within the Northwestern Forest, Forage and Specialty Crop Region. Annual precipitation ranges from 30 to 80 inches. The growing season is approximately seven months.

Ponderosa pine dominates and is the climax species of this forest type. Associated conifers are Jeffrey pine, sugar pine, Douglas-fir, white fir and incense cedar. Some of the principal shrubs and hardwood trees are deer brush, bearclover, whiteleaf manzanita, greenleaf manzanita, California black oak, and canyon live oak.

MIXED EVERGREEN FOREST

This forest type is found in the North Coast Range at elevations from 300 to 6,000 feet; in north-central California from 1,200 to 5,500 feet; in the Sierra Nevada from 2,000 to 7,000 feet; and in southern California at elevations from 5,000 to 8,000 feet. This type occurs primarily in the Northwestern Forest, Forage and Specialty Crop Region. The prevailing climate is similar to, but cooler than, that of the Pacific ponderosa pine type.

The principal conifer species are: ponderosa pine, sugar pine, incense cedar, Douglas-fir, and white fir. Jeffrey pine occurs mostly on serpentine soils. Some of the principal associated hardwood tree and shrub species of the type are California black oak, Sierra currant, bearclover, greenleaf manzanita, whiteleaf manzanita, Mariposa manzanita, deer brush, snowbrush, mountain whitehorn, and bush chinquapin.

RED FIR FOREST

This forest type occurs above 6,000 feet in the North Coast Ranges; in north-central California from 5,500 to 7,500 feet; and in the Sierra Nevada from 6,000 t0 9,000 feet. It occurs in the Northwestern Forest, Forage and Specialty Crop Region. Annual precipitation mostly snowfall, is 35 to 65 inches. The principal conifer species are red fir, lodgepole pine, sugar pine, western white pine, and Jeffrey pine. Principal shrubs in the type are bush chinquapin, mountain whitehorn, snowbrush, greenleaf manzanita, and pinemat manzanita.

WOODLAND TYPE

Of the 1,023,000 acres of forestland (land composed of or capable of being composed of at least 10 percent stocking (crown closure) with tree species) under BLM's jurisdiction in California and northwest Nevada 866,000 acres are classified as woodlands or low site timberland. The low site timberlands are composed of both commercial species and noncommercial species. For management purposes these lands are generally grouped together and managed as woodlands and will be referred to as woodlands throughout this document.

The woodlands are primarily used for fuelwood production, timber production, posts, grazing, wildlife, and other multiple uses as directed or authorized by land management plans, FLPMA, or other authority.

Western juniper occurs as a pure woodland type in northeastern California and northwestern Nevada. Pinyon in combination with junipers (mostly Utah juniper) also occurs in this portion of the EIS area. Both of these types (taken together are known as PJ) occur intermingled with the eastside yellow pine type and out into the big sagebrush type. Together they comprise about 45 percent of the woodlands (389,000 acres). The PJ type has been increasing in acreage during the past 80 years and appears likely to continue. Much of the management activity in this type has been and is likely to continue to be directed at controlling this encroachment. Presently juniper woodland production exceeds demand for products such as fuelwood except near localized areas of utilization.

The remaining 55 percent (477,000 acres) of woodlands consists of various hardwoods adjacent to or intermixed as described in the primary forest types as well as mountain mahogany and aspen in the eastside yellow pine areas. There is considerable demand for hardwoods for fuelwood, but sustained yield of public land hardwoods does not meet these demands.

WILDLIFE

WILDLIFE HABITAT

More than 600 species of mammals, birds, reptiles and amphibians live, or at least meet part of their life requirements on public lands in California and northwestern Nevada. Wildlife populations are managed by the California Department of Fish and Game and the Nevada Department of Wildlife. BLM manages their habitats.

Wildlife species are associated with certain kinds of habitats; vegetation is an important component of habitat. Wildlife habitats are often described in terms of plant communities and successional stages to facilitate evaluation of effects on habitat caused by vegetation management activities. Certain areas like fawning and nesting grounds, migration corridors, and winter ranges are especially important to some species.

Public lands in California and northwestern Nevada include a variety of habitats, including 7.3 million acres of big game habitat, 13.4 million acres of small game and upland game habitat and 235,000 acres of wetland and riparian habitat. Wildlife diversity and the occurrence of rare or unique species and habitat values are among the highest found anywhere on BLM lands. Table 2-3 lists some of the major big game species found in the EIS area and estimated populations on public land.

Table 2-3

Big Game Species and Populations on Public Lands
in California and Northwestern Nevada

Species	Estimated Population on Public Land
Pronghorn Antelope	6,500
Mule Deer	78,000
Black-tailed Deer	33,000
Tule Elk	900
Roosevelt Elk	100
Bighorn Sheep	3,000
Wild Boar	2,600
Black Bear	700

Pronghorn antelope occur in the Great Basin sagebrush habitats on the east side of the Sierra Nevada and Cascade Ranges. Pronghorn are mainly browsers, feeding primarily on sagebrush especially during the winter. Grasses and forbs are important during the spring.

Black-tailed deer and mule deer are the most common, widely distributed, and hunted big game species on public lands in the EIS area. Riparian areas provide important fawning and escape cover for deer.

Tule elk utilize the sagebrush/scrub habitats of the Owen's Valley and the chaparral areas along Cache Creek. Roosevelt elk are found primarily in the King Range on the north coast of California.

Bighorn sheep are almost exclusively limited to desert mountain ranges in southeastern California. BLM lands provide year-round habitat for both peninsular and Nelson's bighorn.

Wild boar are found in the coastal chaparral and are a popular game species.

Upland game birds found on public lands include: sage grouse found primarily in the sagebrush habitats in northeastern California and northwestern Nevada; chukar found on rocky slopes in northeastern California, northwestern Nevada, and in the California desert; wild turkey which utilize oak woodlands; and dove and quail found throughout the State.

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Most of the EIS area's waterfowl are migrant, short-term occupants, following the Pacific flyway during spring and fall. Some waterfowl overwinter near unfrozen water. Nesting waterfowl species of the EIS area include mallard, Canada goose, teal, gadwall, pintail, and shovellers.

Many stockponds, reservoirs, streams, and rivers provide extensive acreage of shoreline and riverbank nesting and feeding habitat required for the existence of shorebirds. Great blue herons, gulls, grebes, snipe, lesser yellowlegs, willets, avocets, terns, sandpipers, killdeer, and long-billed curlews all nest in the EIS area. Many of these species migrate through the area in spring and fall.

The northeastern region of the EIS area is a winter concentration area for golden eagles and rough-legged hawks, which depend upon rabbits as their major winter food source. Bald Eagles congregate in winter roosts near rivers and lakes in the EIS area. Bald and golden eagles, red-tailed hawks, kestrels, marsh hawks, and great-horned owls are all known to nest in the area. The turkey vulture and prairie falcon are also common residents.

Cliff areas, rock outcrops, and shrubs provide nesting sites for most of these raptors. In open country, utility poles, fenceposts, isolated trees, rock outcrops, and other isolated structures provide important perches for hunting raptors. These perches are often well used along transportation routes where traffic-killed small animals are an attractive food source.

Many seed-eating and insectivorous birds inhabit riparian and upland vegetation zones, but little information exists on their densities, distribution, and limiting factors in the EIS area. Woodpeckers and other cavity-nesting birds depend on dead trees for their existence.

The habitats most likely to be affected by vegetation management are sagebrush, chaparral, Mediterranean annual grasslands and early successional stages of coniferous forests. Effects of vegetation management on wildlife habitats are considered in every project environmental assessment. Changes in plant cover will benefit some species and adversely affect others.

FISHERIES HABITAT

Many game fish species inhabit the EIS area, including salmon, steelhead, rainbow trout, brown trout, smallmouth bass, largemouth bass, crappie and catfish.

Anadromous fish (steelhead and salmon) support both commercial and recreational fishing. BLM lands contain only about 10 percent (735 miles) of the stream habitat for anadromous fish in California. However, much of this habitat (489 miles of stream) is high quality spawning and rearing habitat. Declines in anadromous fish populations have been attributed to both adverse effects on habitat and direct harvest of fish.

Fish habitat consists of an aquatic environment and the associated riparian environment. Vegetation management can affect both environments. The effects of vegetation management on fish habitats are considered in project environmental assessments.

THREATENED, ENDANGERED, AND SENSITIVE ANIMALS

The federally listed threatened and endangered species known to occur on public land in California and northwestern Nevada are listed in Table 2-4. Any action that may affect these species is subject to formal consultation with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act.

Within the EIS area, there are at least 284,000 acres and 20 miles of stream habitat providing important habitat for these species. There are additional species on the State threatened and endangered species lists (Table 2-4). Habitat management activities are given priority to ensure their continued survival.

BLM has also developed a list of sensitive species which includes: desert bighorn sheep, northern spotted owl, flat-tailed horned lizard, gila monster, desert tortoise, San Sebastian leopard frog, Inyo Mountain salamander, Amargosa River pupfish, Nevada speckled dace, Shoshone cave whip scorpion, and San Joaquin dune beetle. The northern spotted owl occurs in the Ukiah District and the San Joaquin dune beetle is found in the Bakersfield District. The remainder of these species inhabit the Desert District.

BLM sensitive species are afforded special consideration to ensure that their populations do not decline to the point where listing as threatened or endangered becomes necessary.

Vegetation management must consider the potential effects on all special status species in project environmental assessments to ensure that the continued existence of any of these species is not jeopardized.

LIVESTOCK AND WILD HORSES

Livestock grazing (cattle, sheep, horses and goats) is a primary use of BLM lands in the EIS area. The EIS area had approximately 125,000 head of livestock on BLM lands during 1985 that grazed on about 9 million acres of land, consuming roughly 387,000 animal unit months (AUMs) of forage. Livestock grazing in the EIS area has been covered in detail by 18 site-specific grazing EISs and Resource Management Plans.

The Wild Free-roaming Horse and Burro Act of 1971 (Public Law 92-195) provides for the protection, management, and control of wild free-roaming horses on BLM lands. The EIS area has 35 wild horse management units to provide forage for approximately 2,600 horses and 2,800 burros.

CULTURAL RESOURCES

Federal agencies have been charged with responsibility for managing cultural and paleontological resources on lands under their jurisdictions. Through a group of laws beginning with the Antiquities Act (1906) (Chap. 3060), BLM has been mandated to identify, protect, and enhance such resources on public lands.

Table 2-4

Threatened and Endangered Animals on Public Land in California and Northwestern Nevada

Species	Federal Status	State Status	BLM District
San Joaquin Kit Fox	E	T	Bakersfield
Southern Sea Otter	T	--	Bakersfield
Giant Kangaroo Rat	E	E	Bakersfield, Desert
Amargosa Vole	E	E	Desert
California Condor	E	E	Bakersfield, Desert
Bald Eagle	E	E	Bakersfield, Ukiah, Susanville
American Peregrine Falcon	E	E	Bakersfield, Ukiah
Yuma Clapper Rail	E	T	Desert
Blunt-nosed Leopard Lizard	E	E	Bakersfield
Coachella Valley Fringe-toed Lizard	T	E	Desert
Desert Slender Salamander	E	E	Desert
Mohave Tui Chub	E	E	Desert
Owen's River Pupfish	E	E	Bakersfield
Paiute Cutthroat Trout	T	--	Bakersfield
Desert Pupfish	E	E	Desert
Mohave Ground Squirrel	Cand.	T	Bakersfield, Desert
Stephen's Kangaroo Rat	Prop.	T	Desert
Wolverine	Cand.	T	Bakersfield, Ukiah, Susanville
California Bighorn Sheep	Cand.	T	Bakersfield
Peninsular Bighorn Sheep	Cand.	T	Desert
California Yellow-billed Cuckoo	Cand.	T	Bakersfield, Desert
Elf Owl	--	E	Desert
Inyo Brown Towhee	E	E	Desert
Least Bell's Vireo	E	E	Desert
Magic Gecko	Cand.	T	Desert
Shasta Salamander	Cand.	T	Ukiah
Unarmored Three-spined Stickleback	E	E	Desert
Brown Pelican	E	E	Desert
California Black Rail	Cand.	T	Desert
Swainson's Hawk	Cand.	T	Desert
Gilded Northern Flicker	--	E	Desert
Arizona Bell's Vireo	--	E	Desert
Tipton Kangaroo Rat	E	--	Desert
Desert Tortoise	Cand.	--	Desert

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In many cases surveys of existing cultural resource information (Class 1 inventories) have been completed for areas of BLM Districts and may be examined in the BLM District Offices.

Many archaeological, historical, and paleontological sites have been found on or near BLM-administered land in the EIS area. Some of the information has been lost from all of these sites as a result of natural or human disturbances before discovery. Future intensive surveys are certain to locate many more sites. The identified archaeological sites range from small special purpose sites or seasonally used campsites to major long-term village sites. Most historical sites relate to early settlement, transportation, mining, and logging. Paleontological resources in the EIS area include many vertebrate, invertebrate, and plant fossil sites. Lists and descriptions of known paleontological sites on or near BLM lands are maintained by BLM District Offices.

VISUAL RESOURCES AND RECREATION

Visual resources consist of the land, water, vegetation, animals, and other natural or manmade features visible on public lands. Highways, rivers, and trails of the area pass through a variety of characteristic landscapes where natural attractions such as mountain vistas can be seen and where cultural modifications exist. To enable visual resources to be considered when planning management, public lands have been assigned visual resource management (VRM) classes according to scenic quality, sensitivity level, and distance zone criteria. VRM classes provide objectives designed to mitigate adverse impacts of land management practices on scenic values (BLM Manual 8400). VRM maps and narratives derived from inventories and evaluations of visual resources on public lands may be examined in respective BLM District Offices.

Among the outdoor recreation activities occurring on BLM lands in the EIS area are sightseeing, picnicking, camping, fishing, and hunting. Other popular activities are off-road vehicle use, horseback riding, river floating, and the studying of natural features. Some of these activities, such as camping and picnicking, occur at recreation sites that require vegetation control. Detailed information on recreational use of public lands may be obtained at BLM District Offices.

WILDERNESS AND SPECIAL AREAS

BLM California's preliminary recommendation is approximately 2 million acres out of 6.9 million acres as suitable for wilderness designation. The majority of the 6.9 million acres is the 5.5 million acres of wilderness study areas in the California Desert Conservation Area (CDCA), of which BLM has recommended 1.8 million acres as suitable pending the assessment of mineral survey data. The U.S. Bureau of Mines and the U.S. Geological Survey are expected to complete the mineral reviews by September 1988.

By the end of 1987, all California BLM wilderness studies are expected to be completed. Recommendations will be forwarded to the Secretary of Interior by BY 1988 upon assessment of USGS/Bureau of Mines mineral reports.

The California Wilderness Act of 1984 designated five BLM wilderness areas in the State.

ECONOMIC CONDITIONS

BLM administers roughly 18.5 million of the EIS area's 102 million acres, or 18 percent of the land base. The 1980 population was 23.7 million.

Vegetation control activities generate employment and personal earnings in the local economy. The level and effectiveness of vegetation control on BLM land in the area could prevent the spread of noxious weeds to productive land, increase livestock forage, improve wildlife habitat, and increase forest productivity.

The production of timber, livestock, and crops generate employment and earnings in the regional economy. Vegetation control allows production to take place and also contributes to more economic activity in the regional economy from control expenditures, and also reduces economic losses from fire.

During fiscal year 1986 total receipts of 72 million dollars from public land activities was realized (USDI, BLM 1987b). Of the total most was from mineral activities with $1,010,000 from timber sales and $500,000 from grazing receipts. While the timber and grazing receipts are an insignificant portion of the total earnings of these two activities statewide, they are very significant to households and rural areas where BLM land use is a primary source of income.

In some localized areas markets have developed for the use of woody material for biomass energy generation or production of materials from waste wood. This is a possible alternative to burning slash, etc., and although it is a small market, new equipment and increasing demand may make it a potential market to be utilized when appropriate.

SOCIAL ENVIRONMENT

The social environment affected by BLM's vegetation control program includes individuals; the companies and businesses they work for; the communities, organizations, and groups they have formed; and their agencies and institutions of government. The social environment also includes attitudes, opinions, and perceptions about vegetation control policies and practices. For this EIS, BLM did not undertake a detailed social analysis of the EIS area that included a population profile, demographic analysis, institutional analysis, or formal public opinion survey. During the past several years, however, BLM has conducted studies in the EIS area, with extensive public involvement, for several EISs and many environmental assessments. The following description of the social environment that

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could be affected by BLM's vegetation control program is based on that information and on concerns expressed during scoping for this EIS.

In addition to direct impacts on jobs and personal income, certain social aspects of employment might be affected by BLM's programs: the importance of certain types of jobs to specific communities, dependence on particular jobs, availability of alternative jobs, access to jobs, and a community's level of acceptance of certain types of work. For example, some people highly depend on a certain type of work; for some people, alternative jobs do not exist, access to alternative jobs is limited, or alternative jobs are perceived as inappropriate work. The social effects of job losses are more significant for these people than for those who are flexible and have access to alternative jobs.

A significant social issue related to BLM's vegetation management program is public concern over the use of herbicides and their effects on human health and the environment. Opponents of herbicide use perceive a BLM bias in favor of herbicides. The opponents see BLM as an advocate of herbicide use, defending that position rather than seeking public input to the process of decisionmaking. The proponents see BLM abandoning what they believe to be a demonstrably safe and effective means for controlling noxious weeds and competing vegetation.

The controversy has opposing factions whose points of view are sometimes unaffected by the other side's perceptions of data. BLM is in the middle, having to make decisions that best serve a larger public interest encompassing much more than this controversy. The full extent and intensity of the controversy among the people of the EIS area varies widely with some local areas being very strongly anti-herbicide, particularly within the north coast area of California.

On one side of the controversy the decreased production for timber and grazing and the spread of noxious weeds is also a concern. Some are concerned with (1) the spread of noxious weeds from BLM lands onto private, State, and other public land; (2) the economic losses from this encroachment and competition; and (3) the effects of noxious weeds and undesirable plants on native vegetation. Public interest also exists in cooperative programs of weed control. Concern over the spread of noxious weeds is expressed by county and State laws enacted to control noxious weeds.

The controversy is sustained by the following four factors. First, EPA has approved the chemicals for use and has provided instructions for safe handling and application. For some people this is the whole story. They see no basis for opposition to herbicide use and they also see no reason for BLM to limit herbicide use or to entertain observations that the herbicides used for controlling weeds are used more often and in larger amounts for agriculture and home use than for control of noxious weeds and competing vegetation.

Another factor is that some people are suspicious of the accuracy of EPA's determinations about herbicides. They fear that the approved herbicides may eventually be found to be as dangerous as other substances previously thought to be harmless. By then, they reason, it will already be too late to avert at least some harmful consequences.

A third factor that sustains the controversy is the difficulty in establishing scientifically, in a way that is comprehensible and believable to concerned individuals and interest groups, either the presence or the absence of cause and effect relationships between herbicide use and environmental damage or between exposure to herbicides and human health problems. This complicated scientific situation is important in three ways. In some cases (especially concerning long-term effects), the scientific evidence may simply be inconclusive. Therefore, questions concerning the effects of using a particular chemical, though they appear to be scientific questions, may have to be answered today in social and political terms. Conclusive scientific analyses may not be completed for years. Second, some segments of the public may distrust or reject sound scientific conclusions because they cannot understand the analytical process leading to the conclusions or because they have come to consider all scientific studies concerning herbicides to be inconclusive or dubious. Finally, some people criticize the fact that many studies of the health effects of herbicides are based on research with laboratory animals whereas their direct experiences of perceived impacts on people and wild and domestic animals seem to be ignored. A more extreme manifestation of this problem arises when parties to the controversy do not even agree on the identification of credible sources of information and analysis or on the definition of legitimate scientific research.

A fourth factor that helps sustain the controversy about herbicide use is that some people are increasingly concerned about not having control over their larger environment, including the management of BLM land resources. There is a growing sense that the nonprofessional public has a legitimate interest in how these land resources are managed. A traditional attitude of "leaving resource management to the professionals" is becoming less prevalent, and increasing numbers of people seem to want some say in how professionals do their job. Just as social factors are linked to economic conditions, social factors are linked to other components of the environment such as air and water quality, rare and endangered plants, wildlife and recreation, and human health and public safety issues. For example, some are concerned about the safety of workers and the health of those directly or indirectly exposed to chemicals, with or without awareness of the exposure. Some are also concerned about contamination of water sources that are eventually used for irrigation, stock watering, domestic water supply, and fish hatcheries. These fears and anxieties appear to be directly related to the perception of scientific uncertainty about the existence of health risks.

Chapter 3

Environmental Consequences

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CHAPTER 3

ENVIRONMENTAL CONSEQUENCES

Chapter 3 compares environmental consequences (impacts) of three alternatives to the existing environment as described in Chapter 2 and analyzes the significant impacts resulting from implementing each alternative in relation to these baselines. (Table 1-4 compares composite impacts of each of the three alternatives.) Analysis, including the scoping process, reveals that the proposed program for controlling vegetation would not significantly affect climate, geology, topography, minerals, utilities, communication sites, paleontological resources, energy requirements, or prime or unique farmlands. Therefore, these topics are not discussed.

Basic assumptions of the analysis in Chapter 3 include the following: (1) that BLM will have the funding and personnel to implement the final decision, (2) that all design features described in Chapter 1 and Appendix D will be applied, and (3) that the types and amounts of treatments will be applied as shown in Table 1-1. The program is intended to be in effect for 10 years.

In this EIS, short-term and long-term are defined as follows:

Short-term: the 10-year period following the initial implementation of a vegetation management program.

Long-term: beyond the 10-year period.

IMPACTS ON AIR QUALITY

Air quality could be affected by vegetation management activities. The most pronounced atmospheric effects of herbicide sprays are spray drift (displacement of airborne spray particles from the target area) and volatilization (the conversion of liquid to gas)(Scifres, 1977). Manual and mechanical treatments may generate fugitive dust and the use of prescribed fire produces particulates and visible smoke.

Air in the atmosphere serves as a carrier of chemical spray drift from aerial, ground hand, and ground vehicle herbicide spraying. Liquid spray droplets most prone to chemical drift are usually 100 microns or less in diameter (spray equipment is designed to produce 200 micron droplets). These small droplets may be carried downwind great distances before reaching the ground, or lofted upward and carried even greater distances. If such a cloud of tiny droplets remains concentrated enough upon reaching the ground, physical damage may be done to a nontarget vegetation species on which it descends. Such a situation is normally found when there is severe temperature inversion and little wind velocity. On the other hand, if air-mixing and lofting of the chemical material to higher altitudes occur, it is entirely possible that particles will be sufficiently scattered and degraded to not pose a problem (California Weed Conference 1985).

The extent of chemical spray drift is related to: (1) droplet size, (2) wind direction and velocity, and (3) height above the target at which the spray is released. Droplet size is affected by spraying pressure, type of carrier (whether oil or water), and nozzle size. In general, low spraying pressure and large nozzle orifices produce large droplets. As spraying pressure is increased and/or nozzle orifice size decreased, the spray is broken up into progressively smaller particles increasing potential for their displacement. As spray droplets fall through the atmosphere, they become increasingly smaller until completely evaporated (the rate of evaporation depends on temperature, relative humidity, and carrier) or until contacting a plant or soil surface. Thus, the height above the ground at which sprays are released is extremely important in regulating the extent of chemical spray drift. The potential for chemical spray drift is greater from aerial than from most ground sprayers (Scifres, 1977).

The tendency of herbicides to volatilize is directly related to its vapor pressure. Vapor pressure is the pressure exerted when a solid or liquid is in equilibrium with its own vapor and is a function of the substance and of the temperature (Scifres, 1977). Although herbicide applications result in vapor losses, commercial uses have not shown volatility to lead to phytotoxicity (see Glossary) in nontarget plants (NRCC 1974 in USDI, BLM 1985a). Loss from volatilization is reported to be negligible or insignificant with asulam, bromacil, dalapon, fosamine ammonium, glyphosate, hexazinone, simazine, and tebuthiuron. Minor loss from photodecomposition and/or volatilization of atrazine is not fully understood. It has been reported that atrazine is more subject to ultraviolet light and volatility losses than simazine (Weed Science Society of America 1983). Volatilization of 2,4-D will depend on the particular formulation of 2,4-D, with acids and amines being less volatile than esters, which vary from high to low with the oil soluble amines being considered the least volatile. Dicamba may volatilize from soil surfaces but further study is required to determine the extent of such losses. Studies of diuron have suggested that photodecomposition or volatility losses are insignificant except when diuron is exposed on the soil surface for several days or weeks under hot, dry conditions. Breakdown of picloram occurs in ultraviolet light. The rate of this breakdown is greatest in clear, moving water and on soil and plant surfaces. Triclopyr losses due to volatilization are not appreciable (Weed Science Society of America, 1983).

Fugitive dust generated from the use of heavy equipment in mechanical treatments or from manual treatments usually has only a localized and short-term impact on air quality and visibility. Since Alternative 3 has the greatest amount of mechanical treatments, dust problems would be greatest under Alternative 3, and Alternative 2 would be slightly worse than Alternative 1 as far as dust impacts are concerned.

Increases in particulates and visible smoke are major impacts to air quality expected to result from prescribed burning. Because the Proposed Action (Alternative 1) and Alternatives 2 and 3 propose 26,000 acres per year for prescribed fire treatments in the entire EIS area, particulates and visible smoke are expected to moderately increase on a short-term, localized basis. Because prescribed burning will be conducted during periods of instability, the National Ambient Air Quality Standards (see Glossary) for fine particulate concentrations are not expected to be exceeded, even in nonattainment areas under any alternative. In areas where standards may be exceeded the Bureau will provide the Air Pollution Control District (APCD) with adequate information to secure permits, utilizing a smoke management model such as the Simple Approach Smoke Estimation Model to ensure PM 10 standards are not exceeded.

Although burning would be conducted so as to protect population centers and Class 1 areas from smoke, unforecasted weather changes could cause smoke to reach these locations. With the application of smoke management, the probability of such an occurrence is extremely low primarily because of the conditions proposed for prescribed burning and the use of improved burning techniques such as pretreatment of vegetation by mechanical or chemical means, use of a backing fire or use of the helitorch.

In conclusion, air quality impacts from chemical drift and volatilization are expected to be short term and restricted to the localized area and time of the treatment because of application during conditions of low wind speed and moderate temperature. Fugitive dust impacts from manual and mechanical treatments are restricted to the treatment site. The use of smoke management technology will minimize air quality impairment from prescribed burning.

IMPACTS ON SOILS

Soils can be affected by herbicide, manual, mechanical, and prescribed burning treatments in a variety of ways. The different soil characteristics found throughout the area also affect the behavior of chemicals in a wide variety of ways.

Control of solid stands of vegetation by chemical treatment may result in short-term, insignificant increases in surface erosion that would reduce as vegetation reoccupies the treated site. Reoccupation could occur within a few months or may take several growing seasons depending on the vegetation treated, the type of herbicide and other site-specific factors.

The behavior of a chemical substance in the soil is determined by several properties relating both to the chemical and to the soil environment (Heilman et al. 1979). The persistence of herbicides in the soil is dependent upon a number of factors such as climatic factors and soil properties of a particular site, chemical properties of a particular herbicide, microorganism decomposition and movement in the soil profile. Table 3-1, Comparison of Herbicides, provides a relative comparison of the effects of soils on the 16 herbicides proposed for use in Alternatives 1 and 2 and discussed in more detail in Appendix F. Soils high in clay and organic matter can prevent movement of herbicides (due to leaching) by providing sites for adsorption (adhesion onto the surface of a particle) and absorption (incorporation into a particle) of chemicals. Soils with low pH also tend to increase adsorption. Areas with abundant rainfall increase the chance of herbicide mobilization by leaching or runoff. Most herbicides seem to persist longer in cold, arid climates. Many soil microorganisms can metabolize herbicides, and are often reported to be responsible for herbicide decomposition. There may however, be adverse effects on microorganisms. Experimental tests yield widely varying results, from toxic effects to stimulation of certain populations (USDA, Forest Service, 1987). Due to these widely different behaviors and effects, only through site-specific evaluations of individual projects can impacts and mitigations for a site be determined.

Herbicide use does not involve removal of vegetation from the site, but instead results in a pulse of dead organic matter on the site. Due to subsequent decomposition and release of nutrients, the impact on the nutrient pool may be negligible if soil microorganisms are not affected.

Impacts on soils from herbicide application would be greatest under Alternatives 1 and 2 but nonexistent under Alternative 3. The use of the 16 chemicals under Alternatives 1 and 2 may degrade soil productivity to some extent, increase the potential for soil erosion and mass wasting and build up chemicals in the soil. Repeated applications of herbicides may occur along rights-of-way, at site preparation and release areas, and during noxious weed control. Even so a buildup of herbicide residue in the soil is unlikely because the time interval between applications is expected to exceed the time required for decomposition. Impacts to soils would also be minimized by utilizing mitigation measures described in Appendix D, Project Design Features.

Manual treatment includes the use of simple hand tools for hand grubbing, cutting, and girdling operations such as the saw, axe, shovel, machete, mattock and brush hook. Machines available for use in manual treatment include chainsaw, tree girdler, and scythette. Hand grubbing involves digging out plants from the soil with as much of their root system as necessary to prevent sprouting and regrowth. Cutting and girdling insignificantly impact soil. Hand grubbing could provide short-term, localized slight increases in erosion in treated areas until vegetation reoccupies the area.

Mechanical treatment includes brush chipping, dozing, chaining, crushing, mowing and tilling. Brush chipping and mowing would have localized impact of a slight to moderate increase in soil compaction where heavy equipment was used. Chaining, dozing, and crushing do not materially increase runoff and erosion but leave debris and trash to protect the soil from erosion. Some localized impact of soil compaction could occur however, affecting infiltration and runoff. Tilling would have the most impact on soils, but impacts are relatively short term until vegetative cover has been reestablished on the treatment site. Ripping compacted areas and judicious placement of water bars could effectively mitigate effects of soil compaction from heavy equipment usage (Vallentine 1980). Due to the larger amount of disturbed area Alternative 3 would have the greatest level of impact from mechanical treatments and Alternatives 2 and 1 would have successively less erosion.

All alternatives would involve prescribed burning. The effects of prescribed fire would be directly related to the duration and intensity of the burn as well as on-site characteristics. The use of prescribed fire could minimize the effects of high soil temperatures associated with a wildfire that can cause significant changes in surface soil properties, in particular organic matter content, water repellency, and soil microbial populations. Some short-term insignificant declines in soil productivity in the treated area is expected from loss of soil organic matter which is a major source of nitrogen and sulfur in the soil. The destruction of

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Table 3-1

Comparison of Herbicides (USDA, Forest Service, 1987)

Chemical	Persistence	Adsorption to Soil Particles	Solubility in Water	Mobility
Amitrole	Short-Medium	Strong, but reversible	High	Moderate
Asulam	Short	Negligible	**	Moderate
Atrazine	Long	Readily, but not strong	Low	Moderate
Bromacil	Medium-Long	Low	High	High
2,4-D & 2,4-DP	Short	Not strong	High-acid form salt form Low-ester form	Moderate
Dalapon	Short	None	High	Moderate
Dicamba	Medium	None	High	High
Diuron	Medium	Readily to clays & organic matter	**	Moderate
Fosamine	Short	Strong	High	Low
Glyphosate	Short-Medium	Strong	High	Low to Moderate
Hexazinone	Medium-Long	Low	High	High
Picloram	Long	Low to organic matter	High	High
Simazine	Long	Readily	Low	Moderate
Tebuthiuron	Long	To organic matter & clays	Low	Moderate to High
Triclopyr	Moderate	Not strong	**	Moderate to High

** Data reviewed was insufficient to evaluate this characteristic.

PERSISTENCE - Short = half-life less than 1 month; Medium = half-life 1-6 months; Long = half-life greater than 6 months; varies with climate and formulation.

ADSORPTION - Adhesion of the chemical onto the surface of soil particles.

SOLUBILITY - Low = less than 500 milligrams per liter (mg/L); High = greater than 500 mg/L; will vary with environmental conditions and formulation.

MOBILITY - An evaluation of the chemical's susceptibility to transport by water, based primarily on persistence, with consideration given to strength of adsorption to soil particles and water solubility. Environmental conditions, timing of application in relation to rainfall, and distance to surface or groundwater will affect actual concentrations reaching a water source.

some soil microorganisms could slightly reduce soil productivity also, but impacts would be minor and short-lived because prescribed fires would not involve the intense fires that reduce microorganisms most dramatically (Wells et al. 1979). Short-term increases in erosion could occur until vegetation reoccupies the treated area. Overall magnitude of prescribed burning impacts can be minimized by: burning under weather and fuel conditions that result in a low intensity burn, selection of treatment areas with soil types, topography, physiography, and climate that are best suited to minimize damage to soils, burn when the soils are moist, limiting chaining and crushing preparation work to slopes less than 30 percent, and leave sparsely vegetated areas greater than 50 percent slope unburned.

In summary, chemical residues on soil surfaces may persist and be leached into the soil profile. The probability and extent of persistence and leaching depends on formulations (water solubility), soil moisture, timeliness of rainfall after herbicide application, soil permeability and relative affinity of the herbicide for the soil colloid and/or organic matter fraction. Manual or mechanical methods could on a short-term basis increase soil compaction, disturb soil surfaces and therefore increase erosion. Prescribed fire could produce short-term impacts on soil productivity and erosion until soil microorganisms and vegetation have reoccupied the burn site. These impacts can be minimized by following prescriptions that reduce damage to soils. In the long term erosion on prescribed burn areas would be more stable than if uncontrolled wildfires occurred.

IMPACTS ON WATER RESOURCES

Alternatives 1 and 2 would have varying impacts on water resources, including the possible introduction of herbicides into water and an increase in suspended sediments and dissolved solids. The degree of impact would depend on the size of the treated area, closeness to water, existing water quality, and type of treatment.

IMPACTS ON SURFACE WATER

The likelihood of a herbicide entering surface water depends upon the herbicide's persistence and mobility (see Glossary and Impacts on Soils). Herbicides would most likely enter streams through drift (see Impacts on Air Quality). Some herbicides could also enter streams in surface runoff or through erosion of previously treated soils.

In areas where large streamflows occur, such as in the Sierra Nevada and northwestern California, herbicides entering streams are heavily diluted so that little if any herbicide is detected. In arid or semiarid areas, the normal streamflow is low or ephemeral. Where streamflow results from thunderstorms, surface runoff may flush herbicide residuals into streams in detectable levels. The amounts would depend upon the length of time since spraying in which microbial action has been degrading the herbicide (see Impact on Soils). The longer the interval, the less chance of residuals being present.

The environmental fate on the 16 proposed herbicides is briefly discussed in Appendix F and for more specific information, the reader should refer to Agriculture Handbook Number 633 (USDA, Forest Service 1984) or to studies accumulated by Labat-Anderson Incorporated (1986).

Since herbicide drift is far more variable during aerial spraying, the amount of herbicide drift that reaches the water is expected to be greater with aerial applications and proportionately less with ground hand and vehicle applications. Often no effort is made to exclude aerial spraying across ephemeral stream channels. In these instances rainfall may flush herbicide residues downstream when little time has passed since spraying.

Ground vehicle application produces much less drift than aerial application, and ground hand application would produce little or no drift. Therefore, if herbicides originating from hand application reach the stream channels, it is usually through surface runoff.

Alternative 2 would result in little herbicide reaching a stream through drift. Surface runoff would move less residual spray because less acreage would be involved and spray entering buffer zones could be better controlled. Thus, less residue would exist for movement into streams.

Alternative 3 would result in no herbicides from BLM actions reaching the stream channel.

Normal BLM herbicide applications, using standard controls such as buffer strips, would not affect suspended sediments, total dissolved solids, or water temperature. Other actions under Alternatives 1, 2, and 3, however, such as manual, mechanical, and prescribed burning treatments, could affect water resource conditions.

Physical restrictions on mechanical treatments (such as on steep slopes) and buffer strips next to surface water would limit significant impects to water quality. Short-term increases of suspended sediments in water could be expected under all alternatives with Alternative 3 having the highest level of sediment introduced to streams.

Prescribed burning generally destroys most or all vegetation. This removal of vegetative cover would increase the potential of surface runoff and might increase suspended sediment and total dissolved solid levels in streams. The size of the impact from this treatment would depend on amount of exposed soil, severity of the burn, and distance to the nearest stream. On the other hand prescribed burns to reduce fuel loading reduce the chances of wildfire caused floods and erosion.

Prescribed burning would also provide the beneficial impact of greater water yields (Anderson et al. 1976). Small springs and streams near burned areas often produce greater amounts and flow longer into the summer, due to less water consumed by vegetation. This increase in flow would primarily benefit resident wildlife and livestock as increases would not be significant enough for downstream uses.

IMPACTS ON GROUNDWATER

For a herbicide to reach groundwater, it must be relatively soluble in water, resistant to adsorption by soil and organic matter, and sufficiently persistent to endure until it enters the water (USDA, Forest Service, 1987). Table 3-1 displays the persistence, adsorption, and solubility characteristics of the 16 herbicides and provides a rating of relative susceptibility to water transport based on these characteristics. Since amitrole, asulam, bromacil, 2,4-D, 2,4-DP, dalapon, dicamba, diuron, hexazinone, picloram, simazine, tebuthiuron, and triclopyr are relatively mobile herbicides, the potential exists for detectable traces to enter the groundwater. The relative immobility of glyphosate prevents it from moving down into the soil profile (see Appendix F). The degradability of atrazine, diuron, dicamba, 2,4-D, fosamine, picloram and simazine highly depend on microbes in the soil and water. The number of microbes decreases with depth and groundwater contains few if any microbes to carry on the degradation.

No herbicides applied on BLM-administered lands have been reported to reach the groundwater.

Streams and wetlands are areas where the groundwater often occurs close to the surface. These areas are also high in microorganisms and organic matter. With use of buffer strips spray would reach these areas only by drift. Because the amount of herbicides used in these areas would be low and the microorganisms and organic particles in these areas are high, no significant impacts are expected to groundwater.

WATER RESOURCES SUMMARY

Site-specific environmental analysis conducted before herbicide application will address sensitive areas, including areas where herbicides could be introduced into the streams or groundwater recharge areas. These areas may require mitigation or no treatment at all. Through the required site-specific evaluations and application of standard procedures it is unlikely that any significant (detectable) amounts of herbicide will be introduced into streams or groundwater. There will be short-term impacts to erosion and sedimentation from mechanical and prescribed burn treatments, but these will be offset by the long-term reduction of erosion and sedimentation caused by uncontrolled wildfires. Alternatives 2 and 3 would result in the most noticeable impacts to water resources due to the greater amount of mechanical treatments.

IMPACTS ON VEGETATION

TERRESTRIAL VEGETATION

Management of competing vegetation would have both beneficial and adverse impacts on terrestrial vegetation within the EIS area. Both target and nontarget vegetation in areas scheduled for treatment would be directly affected. The degree to which vegetation would be affected would depend on the types of treatment used and the number of acres treated under each alternative (see Table 1-3). The overall effect of managing competing vegetation would be to accelerate succession for forest management, to achieve desired seral stages in rangeland management situations, to create stratified age structure dynamics in brushlands and chaparral for wildlife habitat improvement and fuel hazard reduction, and to reduce or eliminate populations of undesirable species in eradication programs.

Prescribed Burning

Under all alternatives an average of 26,000 acres per year would be treated. Impacts on competing vegetation from burning would be identical under all alternatives.

Forest Management

Prescribed burning would primarily be used for site preparation. Under all alternatives the acreage proposed is relatively small (100 acres per year).

Burning would temporarily eliminate or suppress competing vegetation, improving conifer survival. By exposing mineral soil, however, burning would also promote the subsequent invasion of grasses, forbs and hardwoods. The germination of some competing shrubs such as manzanita and ceanothus would be stimulated by burning, most often in the mixed evergreen and coniferous forests.

Intense burns would be more likely to kill plant roots than light burns. Lightly burned areas would have a higher percentage of herbaceous and brush cover present within two years after burning. However, growth of this vegetation would be delayed, providing more competitive free growing time for conifers than would be available in most unburned areas. It is estimated that 80 percent of the treatment area would be lightly burned.

Risk of wildfire from escaped slash burns would be the same under all alternatives. Data from western Oregon indicate that only 4.5 percent of BLM slash burns resulted in wildfire from 1980 to 1982 (USDI, BLM 1983). In California BLM-initiated prescribed burns over the last 10 years only four escapes have occurred out of about 300 burns according to BLM records.

Rangeland Management, Fuel Hazard Reduction, and Vegetation Removal

Prescribed burning employed for range improvement, wildlife management, fuel hazard reduction and vegetation removal will primarily occur in chaparral communities (14,900 acres per year under all alternatives). Proposed burning within sagebrush scrub and northern juniper woodlands is of a smaller magnitude (11,000 acres per year under all alternatives).

Burning within chaparral would suppress brush species in the short term, increasing community age diversity and the number of species present. Fire within this community induces a series of successional changes beginning with an herbaceous ground cover in the first year. Long-term effects on species diversity is dependent upon burn timing. Winter and spring burns (wet season) could reduce or eliminate species that depend upon seeds for reproduction while crown sprouting shrubs would increase. Fall (dry season) burns will have no adverse effect on grass and herbaceous vegetation seed sources.

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Prescribed burning within sagebrush scrub and northern juniper woodlands would lead to the short-term removal or suppression of overstory competing vegetation, improving survival and vigor of the more desirable forage plants. Most of the burns would not be intense enough to kill plant roots. Fire treatments would result in reduced competition and subsequent perennial grass release for approximately 3-8 years dependent upon the site's potential (Willard Phillips, Personal Communication). Grass species generally would be positively affected with increased vigor and density.

Burning would be used mostly to control sagebrush. Big sagebrush is a nonsprouter and is highly susceptible to fire injury. The burning of sagebrush would reduce total plant cover; however, the elimination of sagebrush competition would allow for rapid revegetation of the bare ground surface by the existing native vegetation. There would be a short period after the burn during which the site would be susceptible to invasion of undesirable plants such as cheatgrass and medusahead.

Research indicates that needlegrass is the grass most susceptible to damage by burning. The least detrimental effects on needlegrass would occur with a cool and fast fire, good moisture, and burning being conducted in the fall of the year when the plant is dormant (Wells et al. 1979).

Plants are generally most susceptible to fire damage during growth phases when root reserves are low and least susceptible during periods of dormancy. Reseeding is generally not needed after prescribed burns. Soil, vegetation, and topographic conditions generally allow for a natural revegetation of the burn area.

Chemical Treatments

Forest Management

Herbicides impact the species composition, size, density, and vigor of vegetation. Impacts on vegetation would range from complete control to negligible damage depending on species, chemicals used, dosages and timing of applications.

Herbicides used for site preparation, maintenance and release (e.g., picloram, triclopyr, glyphosate, and atrazine) would usually result in a large percentage of brush and hardwood defoliation, a fair amount of topkill (see Glossary) and minimum resprouting. Treatments would not necessarily eliminate all competing vegetation but would temporarily reduce competitors, increasing the amount of light reaching conifers and decreasing brush and grass competition for soil moisture and nutrients. Impacts of herbicides would be greater on plant sprouts or seedlings than on full-crowned, mature plants.

Chemical release would increase the growth rate of young conifer seedlings stressed by competing vegetation. Western Oregon studies on use of selected herbicides for Douglas-fir release show a significant increase in both tree height (Gratkowski and Lauterback 1974) and diameter (Lauterback 1967).

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Oil carriers would also impact vegetation. In addition to improving spray coverage and herbicide penetration, diesel carriers in themselves could damage or kill plants. Occasional damage would occur to individual conifers which began bud break earlier than the majority of conifers in a spray unit.

Herbicide injection for precommercial thinning would leave trees standing and would generate a dense slash layer from dead needles. This would increase fire hazard, the laddering of fuels, and increase potential of injury to conifers. Herbicide injection could also adversely affect released conifers if chemicals were absorbed through root contact with injected trees.

Based on acreage proposed for treatments, impacts of herbicides on vegetation would be greatest under Alternative 1 (Proposed Action), and less under Alternative 2 with no herbicide impacts under Alternative 3. Under Alternative 1, nontarget vegetation immediately adjacent to spray units could be adversely affected by herbicides drifting beyond unit boundaries. Such impacts would be mitigated by buffer strips and application techniques (Gratkowski 1974).

Rangeland Management, Fuel Hazard Reduction, and Vegetation Removal

The overall objective of managing competing vegetation with use of herbicides would be to improve ecological condition and natural plant composition, provide for more favorable herbage production, improve watershed protection, enhance wildlife habitat, pretreat prescribe burn areas, control noxious weeds and certain undesirable plant species, and to remove vegetation.

The herbicides proposed for prescribed burning pretreatment, sagebrush control and tamarisk eradication are selective yielding no adverse effects on grasses. Herbicide (picloram) used in tamarisk eradication may kill or damage interspersed nontarget trees through translocation of herbicides from tamarisk roots to soil to other roots. Vegetation removal needs (e.g., rights-of-way, pipelines, drilling pads, administrative sites, etc.) will be accomplished with broad spectrum, nonselective herbicides that would affect most perennial plants, annuals and biennial grasses, sedges, rushes and broadleaf plants. Maximum weed control measures may require either selective or nonselective chemicals depending upon individual situations.

Nonselective herbicide use would result in the greatest loss on target vegetation. Since chemical drift could injure or kill nontarget vegetation, herbicides would not be applied when weather conditions would defeat their effectiveness or when controlling the treatment would be problematic. With all herbicide use, some chemical residue may be left for varying periods, depending upon soil and climatic conditions.

Before prescribed burns chaparral brush species can be chemically pretreated to achieve a dead-to-live fuel ratio between 1:3 and 1:2 (Green 1981). The herbicides proposed for this type of use (picloram, triclopyr and 2,4-D) are applied in late spring. A single treatment kills roughly one-third of crown-sprouting brush species, but may completely kill more sensitive brush species such as ceanothus and salvia (Green 1981). Full effect of treatments can take from several weeks to a few months.

Herbicide use in sagebrush communities would generally result in brush defoliation and a minimum of resprouting. Treatments would not necessarily eliminate all competing brush species but would reduce competition, thereby increasing the amount of light reaching the surface and decreasing competition for soil moisture and nutrients.

In sagebrush scrub situations where selective herbicides (e.g., 2,4-D and picloram) would be used, broadleaf plants would be the main target group affected. Plants such as rabbitbrush, greasewood, mountain mahogany and many forbs in or near treatment sites could be weakened or destroyed, however with proper timing these problems can be mitigated.

The extent of any nontarget vegetation loss would depend on the proximity of desirable species, both foliage and roots, to treated target plants, method and rate of herbicide application, formulation of the herbicide, and herbicide used. Herbicide application rates would be reduced in riparian areas to mitigate injury to nontarget plants.

Most grasses would resist applications of the expected use rates of picloram, dicamba, 2,4-D amine and ester formulations, tebuthiuron, and triclopyr. Grasses commonly would become more abundant in the short term as plant competition is reduced following range vegetation control. Vigor would also improve due to more favorable moisture and plant nutrient relationships.

Overapplication of herbicides, mixing mistakes, accidental spills, or misapplication would weaken or destroy nontarget vegetation. Timing of herbicide application would be important. Applications of some herbicides during early stages of growth could reduce grass production (USDA, FS 1984).

The herbicide application season for most effective target species treatment would occur when other desirable forbs and grasses are most susceptible to damage. However, this impact would be minimized by following proper application procedures.

Impacts to terrestrial vegetation from herbicides would be most profound under Alternative 1. This is due principally to the short-term adverse effect of aerial application of herbicides on nontarget vegetation. The effects of Alternative 2 would be less since no aerial chemical treatments would affect nontarget vegetation. Such impacts would be reduced by buffer zones and application techniques.

Species diversity in general will not be affected by the use of herbicides, in that, treatments are episodic rather than chronic. Long-term effects would be accelerated forest succession and improved vigor in rangeland communities. Any seeding or planting efforts would also affect species diversity however those actions are not a part of this evaluation.

Mechanical Treatments

Forest Management

Scarification would remove most of the brush in treated areas, killing over 70 percent of the root systems (Newton and Dost 1981). By exposing bare mineral soil, scarification would aid germination of light-seeded species such as grasses and hardwoods. On scarified units where grass establishes itself as the dominant vegetation, conifer seedlings would suffer increased moisture stress and damage from rodents and deer. Damage to conifers from animals could also increase if slash were piled during scarification and left unburned, because piles would provide excellent habitat for rodents. In addition, piling would impact conifer stocking by decreasing plantable acres.

Mechanical cutting (i.e. with Hydro-axe) would have little effect on root systems, increasing the incidence of sprouting. Many competing species such as bigleaf maple, tanoak, madrone and evergreen huckleberry would thrive on repeated cuttings and form dense, vigorous hedges of sprouts.

Scarification, piling and cutting would be most effective in controlling competing vegetation when used in combination with other site preparation methods. Scarification by itself would expose bare mineral soil aiding germination of light-seeded species, such as grasses and alder. Some shrubs would resprout from surviving root systems. The result would be open stands of hardwoods and brush surrounded by a dense cover of grasses and forbs (Newton and Dost 1981).

Impacts of mechanical treatments would be slightly greater under Alternative 3 (600 acres) and progressively less under Alternatives 2 (575 acres) and 1 (475 acres).

Rangeland Management, Fuel Hazard Reduction, and Vegetation Removal

Mechanical treatments such as chaining would remove most of the competing vegetation in treated areas, killing the majority of the root systems. However, mechanical treatment would also result in a greater amount of disturbance to desirable plant species (nontarget plants). This would allow undesirable plant species a greater chance to establish themselves. Reinvasion of competing vegetation could occur quickly even where seeding is included with mechanical treatment. Plant substrates would be adversely affected by mechanical measures. Reseeding with adapted native plants is recommended with tilling types of mechanical treatment in order to replace desirable native plants lost in the treatment process and to ensure effective revegetation with desirable plants and reduce soil erosion loss. Nonnative species may also be seeded especially in sagebrush conversions.

Impacts to rangeland vegetation as a result of mechanical treatments would be greatest under Alternative 3 (2,750 acres) and progressively less under Alternatives 2 and 1 (2,225 and 1,925 acres, respectively).

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Manual Treatments

Forest Management

Manually cutting brush and hardwoods for both site preparation and release would temporarily reduce competition. However, studies and field observations in western Oregon indicate that within 6 months to 2 years after treatment, sprouts of competing species may regenerate to their original height, and brush density could increase significantly (Roberts 1980). These impacts would be most pronounced in the mixed evergreen forests due to the abundance of prolific sprouting species. In addition, manual cutting could result in injury to more than 20 percent of released conifers from saws, falling debris, and shock from exposure (Roberts 1980).

Mulching would prevent the growth of grass and increase available moisture to conifers. A 1982 study in western Oregon (USDI, BLM 1983) revealed a 93 percent survival rate on mulched plots containing Douglas-fir seedlings after three growing seasons. On slopes greater than 65 percent mulch could slip downhill and damage conifer seedlings.

Scalping would temporarily remove competing vegetation from individual planting spots. Vegetation with extensive root systems, particularly some grasses, would quickly regenerate in most areas. Occasional damage to seedlings could occur if scalping were done after planting. Overall, scalping would not significantly impact vegetation.

Impacts of manual precommercial thinning on vegetation would be similar to those of release treatments. Although some damage would occur to released conifers by accidental cutting or by falling trees, precommercial thinning could increase merchantable volume by 20 to 25 percent (Curtis et al. 1982). As with manual release cutting, manual precommercial thinning would leave a dense slash layer on the ground, creating a fire hazard for three to five years, but in some cases the slash could be prescribe burned without damage to the standing trees.

Rangeland Management, Fuel Hazard Reduction, and Vegetation Removal

Hand pulling and hand tools (shovel, hoe, pulaski) would be employed under all alternatives (Table 1-3). These methods are highly labor intensive, requiring periodic retreatment, ranging from every three weeks during the growing season to annually, depending on the target species. These methods have been somewhat successful in controlling annuals and biennials in noxious weed control and vegetation removal along rights-of-way, pipelines, etc. Manual treatments, however, have proven inefficient in controlling creeping perennials in these situations. Manual methods are impractical for large-scale rangeland improvement projects and prescribed burning pretreatment.

With this type of vegetation management treatment, some degree of weed control would be achieved, but most weeds (including many noxious species) would spread due to ineffective control efforts. Undesirable vegetation would increase.

Impacts to terrestrial vegetation would be greatest under Alternative 3 and less under Alternatives 1 and 2.

RIPARIAN HABITATS AND WETLANDS

Riparian habitats and wetlands are the most productive ecosystem within the EIS area. Additionally, from the standpoint of animal diversity and numbers of individuals per acre, these areas are probably the most important habitat type in the EIS area. Strict adherence to the project design features for riparian habitat and wetland protection would be required during any treatment which employed the use of herbicides near these important areas. If these features are followed, no long-term adverse impacts to these important habitats are likely to occur.

Principal herbicide treatment in riparian and wetland areas would be hand application of chemicals to the introduced exotic tamarisk. The potential minor adverse impacts from transfer of herbicide between roots to nontarget vegetation would be short term. Long-term effects of tamarisk removal would be positive and highly beneficial to the health of the ecosystem.

NOXIOUS WEEDS

Treatment of noxious weeds could affect both target and nontarget vegetation. Alternatives 1 and 2 would have the greatest effect on noxious weeds in the EIS area. Alternative 3 would have less effectiveness on noxious weeds.

Glyphosate, the least selective of the herbicides that would be used under Alternatives 1 and 2, would result in the greatest loss of nontarget vegetation. For dicamba, picloram, and 2,4-D, broadleaf plants would be the main nontarget group affected. Plants such as rabbitbrush, greasewood, mountain mahogany, sagebrush, willows, aspen, and many forbs in or near treatment sites could be weakened or destroyed.

The extent of any nontarget vegetation loss would depend on closeness of desirable species to treated weeds, method and rate of herbicide application, formulation of the herbicide, and herbicide used.

The most effective and efficient control of noxious weeds would be under Alternatives 1 and 2. Aerial application of herbicides within the EIS area is not proposed for noxious weed control. Alternatives 1 and 2, therefore, would have similar effectiveness and impacts for noxious weed control. Alternative 3 (no herbicide use) would utilize manual and mechanical control methods which are much less effective and much more expensive, but would have few impacts to nontarget vegetation.

THREATENED, ENDANGERED OR SENSITIVE PLANTS

Unidentified populations of threatened, endangered or sensitive plant species could be susceptible to any impacts described under terrestrial vegetation. Direct effects of injury or death to plants could cause the immediate elimination of a species in all or a significant portion of its range. The more subtle effects of vegetative community changes could cause the eventual elimination of a species on a specific site locally through loss of competitive ability relative to other vegetation.

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If any species of vascular plant is determined by the U.S. Fish and Wildlife Service to be threatened or endangered, any action that would jeopardize its continued existence would be in violation of the Endangered Species Act of 1973, as amended. Furthermore, all sensitive species will be afforded the full protection of the Endangered Species Act (excluding formal Section 7 consultation) unless the State Director judges on a case-by-case basis that the evidence against listing a particular plant species is sufficient to allow a specific action.

Therefore, environmental analysis accomplished prior to any site-specific action would document any threatened, endangered or sensitive plant species known to be present on the site and identify appropriate measures to be taken to protect the species. If the EA determines that the project may affect any listed species, consultation pursuant to Section 7 of the Endangered Species Act would be undertaken.

VEGETATION SUMMARY

The overall impact of all alternatives would be to suppress competing vegetation. In a forest management context this means increasing conifer growth and survival to maintain productivity. For rangeland improvement the desired result is increased grass production for livestock, wild horses and grass-eating wildlife. Chaparral treatments will reduce fuel hazard and improve wildlife habitat.

The greatest levels of vegetation control would be provided under Alternative 1 (see Table 1-3) which would include the full range of vegetation management practices and would treat the largest number of acres through herbicide application. Adverse impacts to nontarget vegetation would also be greatest under this alternative.

Less impact on competing vegetation would occur under Alternative 2, which prohibits aerial application of herbicides. Alternative 3 would least impact competing vegetation resulting in the lowest level of conifer survival and rangeland improvement acreage.

Herbicides would provide greater control of resprouting vegetation than other treatments, particularly when applied prior to burning. Suppression of most competing vegetation through manual cutting would be temporary because sprouts would quickly regenerate, increasing brush density to above pretreatment levels. Mechanical treatments would temporarily remove competing vegetation from sites but would aid germination of grasses and hardwoods, in forest situations. Mechanical measures would also prove only marginally effective in rangeland management and vegetation control.

IMPACTS ON FORESTED AREAS

Impacts to timber yield were developed from the information in the SYU-13 and SYU-15 documents (USDI, BLM 1981b and USDI, BLM 1981c).

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ALTERNATIVE 1, PROPOSED ACTION

Under the Proposed Action the annual allowable cut would be 21.6 million board feet for California. The Proposed Action assumes herbicide application on 900 acres per year over the next 10 years. This is higher than required for the long term because treatments have not been current for at least the last 30 years. After reducing the current backlog to zero the annual treatment acres by herbicides would drop by at least 50 percent.

ALTERNATIVE 2, NO AERIAL SPRAYING

Under this alternative the treatable acreage by herbicides would decrease to approximately 60 percent of the level for Alternative 1. Other types of vegetative treatments would not increase significantly because of economic inefficiency. That is, treatment would be foregone and reduction to the allowable cut would occur. The annual allowable cut would decrease to 20.5 million board feet and forest development costs would increase slightly over Alternative 1.

ALTERNATIVE 3, NO ACTION/NO HERBICIDES

Under this alternative the allowable cut would decrease by 20 percent to 17.3 million board feet. There would be an increase in total forest development costs as more expensive manual methods are used to attempt to meet forest development needs. Under the expected BLM funding levels it would not be possible however to treat all acres requiring vegetation control for forest management.

IMPACTS ON WOODLANDS

The woodlands are discussed as two distinct types, the juniper woodlands, and the hardwood woodlands.

Juniper Woodlands

Most of the prescribed burning program which is conducted in woodland types is in the big sage/juniper types. The primary reasons for these burns are to halt the encroachment of juniper into the big sage type and to improve range condition. Of the proposed annual treatment acres, approximately 1,000 acres of the big sage type includes at least 10 percent stocking of juniper. This is the minimum stocking level to be considered forestland or woodland in this case.

In the proposed action approximately 500 acres of big sage/juniper woodlands would be sprayed with herbicide for range improvement. The herbicide use is primarily to control sagebrush and although junipers may be sprayed they would only be slightly affected by the herbicide. Some kill on portions of juniper trees may occur but in most cases the entire tree would not be killed.

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Harvest of juniper for fuelwood and posts removes the larger juniper from the equivalent of 200 acres per year in scattered patches. Much of this is concentrated and considered to be range improvement.

All three alternatives include prescribed burning and fuelwood harvests at the same level and since herbicide application has little effect on the junipers there is no difference in effect for the three alternatives considered.

Hardwood Woodlands

Hardwood woodland types are those which do not fall within the commercial softwood forest types. Therefore hardwood control within the commercial forest is not addressed in this section. There is no intention to control areas designated as hardwood woodlands under any of the alternatives, however they may be affected by the prescribed burning and spraying program in the chaparral types. These woodland types are often adjacent to or intermixed with the chaparral and would be unintended targets.

Prescribed burning in hardwood woodlands is constant for all three alternatives. Herbicide use to control the brush or chaparral species in Alternative 1 would have the most effect on the hardwood woodland types mainly due to herbicide drift. Alternatives 2 and 3 would have fewer impacts since spray can be directed where desired in Alternative 2 and none would be used in Alternative 3. Overall there would be no difference in effect on the hardwood woodland types because treatments can be well controlled and are not intended to be directed at these species. Any minor impact to woodlands from accidental burns would be offset by the beneficial effects of the chaparral management program, namely fire hazard reduction under all alternatives.

IMPACTS ON WILDLIFE

TERRESTRIAL VERTEBRATES

Impacts on wildlife from vegetation management would be both positive and negative, depending on the species affected and the type of treatment used. Quantified impacts on wildlife species will be identified in individual environmental analyses, when site-specific proposals are selected. In all cases, impacts on wildlife will essentially be the result of habitat alteration. No direct toxic effects are expected from the use of any of the herbicides proposed for use. A risk assessment related to possible toxic effects to wildlife and aquatic species has been done and is included in this document as Appendix L. The assessment found that risks to wildlife from chemicals would be low to negligible, with no likely effect to larger animals.

Chemical Treatments

Herbicides significantly modify wildlife habitat by suppressing certain forms of vegetation for the release of others.

Alternative 1

The reduction or elimination of big sagebrush on 3,000 acres per year would have mixed impacts on wildlife. Thermal and escape cover for deer and antelope would be reduced on any winter range treated. There may also be a loss of nontarget bitterbrush which would negatively affect deer winter range. However, sagebrush reduction would improve grass and forb composition. This would benefit both deer and antelope during the spring when nutrition is especially important for lactating does.

Spraying winter concentration areas or nesting grounds would be detrimental to sage grouse as thermal cover, food supply and nest sites are reduced. In general, spraying in big sagebrush tends to reduce habitat diversity and stratification which result in a corresponding reduction in nongame diversity. This impact is most significant in large treatment blocks.

Spraying of 1,700 acres of chaparral annually would generally benefit most species of wildlife. Dense, decadent chaparral currently provides low value habitat. Spraying when followed by prescribed burning of chaparral would open up areas of habitat currently unavailable to deer and would increase the amount of edge or ecotone. This would actually increase habitat and nongame species diversity. The localized loss of chaparral-dependent species would be insignificant due to the small percentage (0.02 percent per year) of this habitat type to be treated.

Chemical treatment of 1,150 acres of grassland per year would have no significant effects on wildlife. The majority of grassland control would be in small patches associated with rights-of-way, utility corridors, oil well pads and noxious weed control. Most sites would be less than 10 acres.

Herbicide application would generally have adverse effects on wildlife on 900 acres per year of forestlands. Suppression of grasses, forbs, brush and hardwoods would reduce habitat capability for all species using early seral stages. Deer use would increase temporarily, but long-term reduction in deer forage would occur. Nongame species diversity would decline as a result of reduced habitat (vegetation) diversity and stratification.

Chemical control of tamarisk on 150 acres annually would generally benefit wildlife. Dense stands of impenetrable tamarisk would be opened up for reestablishment of native riparian vegetation. This increased habitat diversity would yield a corresponding increase in animal species diversity. Overall condition of desert riparian habitats would be improved.

The majority of the impacts on the 6,900 acres of habitat annually affected by Alternative 1, would result from aerial spraying on 5,200 acres per year. Aerial spraying would be used for generalized control over fairly large tracts. Ground application of herbicides both by hand and by vehicle on 1,700 acres per year would retain more diversity by allowing for more selective control of target species on a more site-specific basis.

Exposure to acutely toxic levels of herbicides is not anticipated, as none of the herbicides proposed for use have been reported to be highly toxic to animals when used in accordance with manufacturers' labels (Weed Science Society of America 1983). Chronic effects of herbicides on wildlife are

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not anticipated. Animals are not likely to be exposed to repeated treatments, and herbicide residues ingested are excreted rather than concentrated in body tissues. See Appendix L for greater detail regarding toxic effects.

Alternative 2

Impacts on wildlife resulting from herbicide application would be similar in nature to those under Alternative 1. However, the level of impacts would be diminished by reducing the total of treatment areas to 1,950 acres per year. The magnitude of impacts would be further reduced by using only ground application which allows for increased selection for target species and the smaller average size of treatment. These impacts would affect sagebrush and chaparral habitats which would receive very little control compared to Alternative 1. Potential benefits to deer and nongame species in chaparral communities would not be realized.

Alternative 3

Not applying herbicides would eliminate the potential for adverse impacts on wildlife resulting from chemical vegetation control. However, the potential benefits to wildlife in chaparral and desert riparian areas would not be realized either. These areas would remain in unsatisfactory condition for wildlife.

Manual Treatments

Manual control of vegetation on 500 acres per year under Alternatives 1 and 2, or 1,200 acres per year under Alternative 3 would have no likely significant impacts on wildlife. Manual control methods are very selective for target species. Nontarget species and key areas can be easily avoided. Even treating 1,200 acres represents less than 0.01 percent of the wildlife habitat on public land within the EIS area.

Mechanical Treatments

Chaining, crushing, plowing, slash piling, etc., all reduce structural diversity. Food and cover for deer and a variety of nongame species would be reduced on 475 acres of forest habitats under the Proposed Action (575 acres and 600 acres under Alternatives 2 and 3).

Mechanical treatments on 1,425 acres of chaparral under Alternatives 1 and 2 (1,650 acres under Alternative 3) would benefit deer and nongame species by opening up dense, decadent brush fields. Habitat diversity would increase. Wildlife habitat would receive insignificant impacts in grassland and alkali sink habitats. Approximately 500 acres of this type are proposed for mechanical treatment annually under Alternatives 1 and 2 (700 acres under Alternative 3). These treatments would generally be in small areas, associated with rights-of-way and oil and gas well pads.

Impacts on wildlife resulting from mechanical treatment would be greatest under Alternative 3 (3,350 acres) and least under Alternative 1 (2,400 acres). Alternative 2 would impact 2,800 acres.

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Prescribed Burns

Impacts on wildlife have been fully documented in the Chaparral Management Program Final Environmental Impact Report (CDF 1981), and numerous site-specific environmental analyses prepared by all District Offices in California. Overall impacts from prescribed burning are beneficial to wildlife populations. However, there are some short-term, localized losses of individuals of some species. Prescribed burning would affect 26,000 acres of wildlife habitat annually under all three alternatives (14,900 acres of chaparral, 11,000 acres of sagebrush and 100 acres of forest are expected to be burned annually). This represents continuation of an existing, ongoing program. There would be no change from the existing situation resulting from prescribed burns under any of the alternatives.

FISH

Vegetation management can impact fish and aquatic habitat by causing changes in food supply, water temperature, water chemistry and bottom composition. Vegetation control, both chemical and mechanical can lead to increased sedimentation. This can reduce or eliminate suitable spawning substrate for salmon, steelhead and trout.

Elimination of multistoried vegetation along streambanks increases water temperature and reduces the supply of invertebrates used as a food source for fish.

The only potential for these impacts would be from aerial sprays in big sage and forest habitats. Other methods of control avoid riparian zones; and other habitats proposed for treatment do not contain significant fisheries values. These impacts could occur only under Alternative 1, and could be essentially eliminated through the use of buffer zones.

The possibility exists for herbicides to enter streams through either accidental direct application, drift, or movement of chemical residues from upland areas. As discussed in the Water Resources section, no significant amount of herbicide is expected to reach streams due to standard operating procedures and the mitigations which result from site-specific EAs before any applications. If chemicals are introduced to streams any exposure to fish would likely be of very short duration. Because of this short exposure and the proposed application rates, herbicides are not expected to significantly affect fish or their habitat under any alternative. For a detailed discussion of herbicide risks to aquatic organisms see Appendix L which relates possible doses to documented toxic effects on aquatic organisms. Only under highly unlikely assumptions related to aerial application would any significant risk to aquatic organisms and fish occur. Incorporation of buffer zones would eliminate any adverse impacts from applying picloram and herbicides applied aerially.

THREATENED OR ENDANGERED ANIMALS

Threatened or endangered species receive special attention under the provisions of the Endangered Species Act of 1973, as amended, and BLM policies and guidelines as outlined in Chapter 2. Known nest and roost sites of listed species are avoided or special precautions taken to ensure their protection. Formal consultations with the U.S. Fish and Wildlife Service, under Section 7 of the Endangered Species Act, are initiated for any action that "may affect" a listed species or its critical habitat. No adverse impacts to threatened or endangered species are anticipated under any of the alternatives.

WILDLIFE SUMMARY

Impacts on wildlife resulting from vegetation management would be mixed. Big game, upland game and nongame populations and diversity would benefit in some areas (chaparral, desert riparian, big sage, and forest) as a result of opening up dense brush fields, increasing edge effect and increasing vegetation and structural diversity. In other areas (big sage and forest), localized reductions in food supply and cover would negatively affect game and nongame species. As shown in Appendix L there are no likely toxic effects to wildlife from herbicide use, however aquatic species are susceptible to toxic effects especially under highly unlikely and accident scenarios.

In relation to the 14 million acres of wildlife habitat on public land in California and northwestern Nevada, these impacts are insignificant. Alternative 1 affects 0.07 percent of the EIS area's wildlife habitat annually. Approximately one-third of this would be in small tracts less than 40 acres in size. Only 0.04 percent would be affected annually under Alternative 2, all of this in small tracts. The impacts on wildlife under Alternative 3 would occur on 0.03 percent of the habitat.

Overall wildlife populations and species diversity within the EIS area would not change under any of the alternatives.

Table 3-2

Impacts on Wildlife by Alternative[1]

Impacts	Alt. 1	Alt. 2	Alt. 3
Pos. and Neg. (big sage and forest)	4,800 ac.	1,950 ac.	1,550 ac.
Positive (desert riparian & chaparral)	3,300 ac.	1,600 ac.	1,700 ac.
No Effect (woodland savannah, grassland, desert woodland)	1,700 ac.	1,700 ac.	1,300 ac.

[1] Excludes prescribed burns which total 26,000 acres under all three alternatives.

IMPACTS TO LIVESTOCK AND WILD HORSES

Impacts to livestock and wild horses could occur indirectly from exposure to herbicides. The potential for this occurring is reduced however by not allowing grazing within sprayed areas for one grazing season. Although not identified as an issue, impacts could also occur directly from ingestion of poisonous noxious weeds. Herbicide treatment has also been identified as increasing palatibility of certain toxic plants.

Chemical treatments are generally applied in a form or at such low rates that they do not affect livestock. Most major treatments under the proposed alternatives would be applied when livestock are not in the treated area but spot treatments for control of noxious weeds would be applied at any time, regardless of the presence of livestock. Animals consuming forage treated with certain herbicides (picloram, 2,4-D and dicamba) cannot be slaughtered for food within the period of time specified on the herbicide label. Dairy animals should not be grazed on areas treated with certain herbicides (picloram, 2,4-D, and dicamba) for the length of time specified on the label.

Alternative 1 would yield the most profound positive impact by providing the largest increase in desirable forage for livestock and wild horses. Positive impacts of Alternatives 2 and 3 would be similar to one another yielding less forage production than the Proposed Action. Aerial herbicide application in Alternative 1 would also kill some shrubs and trees which are used for shelter by livestock. Manual and mechanical control under Alternative 3 would often be ineffective at controlling competing vegetation.

IMPACTS ON CULTURAL RESOURCES

Mechanical and burning control measures could potentially disturb or destroy cultural resources on or near the ground surface. The potential for damage would vary with the amount of ground disturbance and burning under each alternative. Tilling weeds could damage artifacts and disrupt relative positions of cultural materials. Mixing organic matter in archeological sites could contaminate carbon 14 dating samples, making them unreliable for scientific analysis. Uncovering sites could increase the possibility of illegal artifact collecting. Burning for weed control could destroy combustible cultural materials and damage stone and ceramic artifacts. There would be lowest potential for damage to cultural resources under Alternative 1 and a slightly higher potential under Alternative 2 with highest potential under Alternative 3.

Cultural resource surveys, however, would precede management actions that could damage cultural resources (BLM Manual 8100, Cultural Resource Management). Under all alternatives, sites found during these surveys would be managed in accordance with the National Historic Preservation Act of 1966 (PL 89-665) and Executive Order 11593, or the California Programmatic Memorandum of Agreement per 36 CFR 800.

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IMPACTS ON VISUAL RESOURCES AND RECREATION

Treatments such as tilling, burning, and applying herbicides cause visual impacts mainly by creating color contrasts between treated areas and surrounding vegetation. Tilling disrupts the land surface and exposes bare soils to view. In addition to causing color contrasts, applying herbicides reduces vegetation variety and can prevent the occurrence of seasonal changes (spring flower, fall color) within treated areas. Burning creates contrasting blackened areas and releases smoke, which temporarily impairs visibility. These short-term impacts, however, would be offset in the long term by the growth of desirable plants on the site.

Most vegetation control treatments would be applied in visual resource management (VRM) Class IV areas (see Glossary). Because these public lands are generally of low to moderate scenic quality, are low sensitivity areas seldom seen by most people, and are intermingled lands managed mainly for livestock grazing, visual and recreation impacts in VRM Class IV would be low under all alternatives. Impacts of herbicide residue on the health of public land visitors are discussed in Impacts on Human Health.

Designated BLM recreation sites that are treated with herbicides will have signs posted stating the chemical used, date of application, and a contact number for more information. Signs will remain in place for at least two weeks after spraying.

Alternative 3 (No Action/No Herbicides) would adversely affect recreation areas infested with noxious weeds by increasing the exposure of visitors to the stickers of thistles and poison oak. Visitor use could decline. Alternatives 1 and 2 would benefit recreation areas infested with noxious weeds by decreasing visitor exposure to detrimental effects.

IMPACTS ON WILDERNESS AND SPECIAL AREAS

The control of vegetation in wilderness and wilderness study areas (WSAs) under all Alternatives would control exotic weeds that would otherwise compete with native plants. Under Alternative 3 though, fewer acres would be treated and less effective noxious weed control might be expected. Under Alternative 3, and Alternative 2 to a lesser degree, there would be less likelihood for accidental sprayings of wilderness and wilderness study areas.

As with wilderness areas or WSAs, all weed control treatments applied on or near the following designated or proposed areas would incorporate features designed to avoid or mitigate impacts on important resources: research natural areas; outstanding natural areas; national wild, scenic, or recreation rivers; national scenic or recreation trails; state recreation trails; and areas of critical environmental concern. Impacts would be most likely under Alternative 1, which proposes aerial spraying, and nonexistent under Alternatives 2 and 3. Site-specific impacts to special areas will be addressed further in District or Resource Area environmental analysis that precedes vegetation management action.

IMPACTS ON ECONOMIC CONDITIONS

Economic results of implementing any of the alternatives would be insignificant when considered in relation to the overall economy of the EIS area. When considered locally though economic considerations become more significant.

Appendix E presents the estimated costs of implementing each of the alternatives. These costs show only a 7 percent difference in total cost of the alternatives and an 10 percent difference in average treatment cost per acre between alternatives. However if the cost of prescribed burns is not included (since proposed burns are constant) the difference in cost per acre by alternative increases to 65 percent. Average cost per acre of nonburning treatments would be: $92.39 - Alternative 1; $129.76 - Alternative 2; and $152.14 - Alternative 3. This comparison gives a realistic comparison of the basic cost of each alternative and what an additional acre of accomplishment under each alternative would cost.

An indirect cost of vegetation control would be the cost of lost opportunity to improve forage production, wildlife habitat, timber production, and other benefits on areas left untreated. Compared to Alternative 1 Alternatives 2 and 3 leave 4,550 and 5,250 acres respectively untreated. These shortfalls in control efforts will result in lost opportunity to improve or maintain forage and timber production and other benefits which would be increased by control efforts. While these benefits are not possible to completely quantify, the effect on revenues from sale of timber alone are estimated to be $51,400 less for Alternative 2 and $202,000 less for Alternative 3 than under Alternative 1.

While economic information on range improvements is not available at this time a site-specific evaluation (SageRam, BLM Manual Handbook H-1743-1) is required before range improvements can be undertaken. This evaluation examines the cost and benefit of each proposed project.

BLM would fund the costs of vegetation control for reforestation, range improvements and recreation maintenance. Costs for wildlife habitat improvement (tamarisk control, chaparral management) are funded by BLM, CDF&G and other contributors. Costs for noxious weed control are funded primarily by counties and the state, while private companies would fund vegetation control associated with right-of-way and lease maintenance. Because of these different funding sources the cost of vegetation control is spread among many sources.

The costs to implement any of the alternatives is small when compared to the total costs for similar actions statewide. Expenditures for herbicides by agricultural interests in the area are much greater than proposed in Alternatives 1 and 2. The California Department of Forestry and Fire Protection, USFS and private landowners spend much more for prescribed burns than BLM proposes. These factors all demonstrate the relative economic insignificance of BLM's vegetation control program on a statewide basis. However the program is very important when considered on a local or site-specific basis. Local individuals rely on both the continued productivity of public lands and on employment in vegetation control activities for their economic livelihood. These people often reside in areas where the local economy relies to a great degree on the expenditure

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of dollars for vegetation control and utilization of resources from the public lands, i.e., livestock forage, lumber industry, and recreational opportunities. There is often no other viable means of economic support in these communities.

In summary the proposed program would allow for economic productivity of the public lands with Alternative 1 providing the greatest return and Alternative 3 the least. This relationship would also be the same for impacts to localized rural economies. Besides providing the highest level of economic productivity Alternative 1 would have the lowest unit cost and Alternative 3 has the highest unit cost.

IMPACTS ON THE SOCIAL ENVIRONMENT

BLM's noxious vegetation control program would directly and indirectly affect social conditions and attitudes. Direct impacts would occur when senses of personal well-being or economic security are affected by BLM's decisions on the use or restriction of vegetation management practices. Indirect effects would occur as a result of economic outcomes of BLM policies and in response to gains or losses of recreational opportunities or access to subsistence activities. Examples of social effects deriving from economic impacts include people's reactions to changes in the availability of different kinds of jobs and their dependence on certain jobs. Whether direct or indirect, all of these impacts could affect lifestyles.

The economic impacts of the alternatives on the local economy are discussed in the preceding section of Chapter 3. The economic effect on individuals who gain or lose jobs would be essentially the same wherever they live. Social effects, however, would depend on whether the jobs gained or lost are concentrated or dispersed or in small or large communities. For example, the gain or loss of jobs scattered around the larger cities in the EIS area would not have significant social effects. In contrast, the concentration of that same number of jobs in a few small towns could significantly affect social conditions in those towns.

The social impacts of employment changes can be estimated, but data does not exist to allow the projection of where those impacts would occur.

Alternatives 1 and 2 would probably have beneficial social impacts related to public land productivity on communities in the EIS area, and none of the alternatives is expected to have significant social impacts resulting from employment changes associated with increases or decreases in forage or timber productivity. Any affected jobs would probably be mostly in the northern half of the EIS area.

Because of the controversy surrounding herbicide use, Alternatives 1 and 2 would have social effects specifically related to this issue. Alternatives 1 and 2 propose the use of herbicides and would be perceived as involving some harm by those opposed to herbicides. These impacts would be greatest under Alternative 1 and somewhat less under Alternative 2. Alternative 3 would be perceived as having the most adverse impacts by those who support the use of herbicides in vegetation management.

Many people believe that herbicides are safe to use and that risks associated with herbicide use are acceptable to themselves as individuals and to society. These people could perceive limitations on the use of herbicides as threatening to their jobs and lifestyles, and in some large sense to society as a whole. The threat they perceive to society is usually articulated as job losses forcing some to go on welfare. Manual release workers and businesses would feel the opposite with the fear that less emphasis on manual methods could affect their employment opportunities.

On the other side of the herbicide controversy are others, particularly residents near areas to be sprayed, who perceive helicopter spraying as a threat because they associate helicopters with military activities or because they feel helpless to avoid exposure or to stop the spraying in case of unexpected drift or accidental overflight of nontarget areas. These people would be adversely affected by Alternative 1, which proposes helicopter spraying of herbicides.

Another category of social effects related to the use of herbicides includes fears and anxieties about human health and personal safety. These concerns would be related to the amount of herbicides used and would thus be greatest under Alternative 1 and less under Alternative 2. For those concerned about this issue, Alternative 3 would have beneficial impacts.

IMPACTS ON HUMAN HEALTH

PRESCRIBED BURNING

Smoke from burning is not expected to significantly affect human health under any alternative. Levels of suspended particulates (a suspected factor in some health problems) are expected to be well below the 150 micrograms per cubic meter (ug/m^3) public welfare standard and the 260 ug/m^3 public health standard published by EPA. Effects of smoke would be minimized by complying with the required burn permits which include coordination with weather forecasts to determine burn or no burning days.

Burning of vegetation previously sprayed with herbicides would not be done for several months to one year after the spraying. This would allow the chemicals adequate time to be degraded to nonhazardous metabolites. An analysis on H-90 utilizing chemical half-lives and a delay of only 2 weeks shows very little chance of the chemical dose in air to be of concern after burning. Thus there would be no expected impact to humans from combustion.

Workers on burn areas would be exposed to potential injury from the manual treatments they would apply and the conditions under which they would work (see discussion under Manual and Mechanical Treatments below). Workers who manually ignite burn areas would be exposed to burning materials, which could cause physical injuries.

The probability of workers on burn areas being injured would be the same under all Alternatives.

Public safety would not be affected by any method of igniting burn areas. Most burning would occur where the public either would not be present or would be highly visible to those doing the burning. Further, those on or near a burning area would be well aware of impending activities because several hours of active preparation are required before ignition begins. Safety measures normally taken to protect firefighters participating in prescribed burning would also protect the public.

A report to BLM on impacts of smoke from burning is found as Appendix G. This report basically studies the polyaromatic hydrocarbons (PAH) found in smoke and is the first step in assessing the potential environmental health risks associated with smoke derived from burning forest and range residues. Products of combustion include several discrete groups. There are a great number of low-molecular hydrocarbons which are relatively innocuous, nitrogen oxides may have some environmental effects but may not represent a primary health hazard, and then the PAH which are large compounds of multiple benzene rings. The analysis in Appendix G concentrates on these compounds as the most likely candidates for human health risk, primarily cancer. Based on assumptions concerning exposure over 70 continuous years to benzo(a) pyrene (BAP) (one PAH) a conservative probability of 3×10^{-3} for contracting cancer is predicted. A more realistic risk of cancer based on research measurements of all PAHs in smoke is 8×10^{-8}. It is questionable if the rather severe exposure sequence assumed for prescribed fire would ever occur. However it should be used for analysis until additional specific data causes it to be changed.

MECHANICAL TREATMENTS

Operators of machinery (tractor operators) could be injured by losing control of equipment on steep terrain or by coming into contact with flying debris and brush. Such hazards would be most likely under Alternative 3 and least likely under Alternative 1.

MANUAL TREATMENTS

Under Alternative 1, and particularly Alternatives 2 and 3, some hand pulling would be needed. Hand pulling exposes workers to the hazards of physical contact with irritant weeds that cause blisters, inflammation, and dermatitis. Sensitive individuals can react severely to the pollens and the close contact of hand pulling could cause major discomfort or health risk. A severe hazard of hand pulling is the high potential for poisonous snake bite. The remoteness of many treatment areas and the time needed to gain medical attention could make a poisonous snake's bite a serious health concern.

There would also be some hazard to operators of chainsaws for manual treatments. The level of hazard would be highest under Alternative 3 and lowest for both Alternatives 1 and 2.

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CHEMICAL TREATMENTS

The analysis of human health risks from the use of the 16 herbicides in BLM's California vegetation management program was accomplished using the methodology of risk assessment widely accepted by the scientific community. In essence, the risk assessment compares herbicide doses that people may get from applying the herbicides or from being near an application site with doses shown likely to be safe to humans in long-term studies on laboratory test animals. For the herbicides that could possibly cause cancer, the risk of cancer over a person's lifetime was based on animal studies that related the chances of developing tumors to increasing herbicide doses. The details of the risk assessment are presented in Appendix H.

The conservative approach used in this risk assessment tended to exaggerate the estimated risks to human health from herbicide use. A number of assumptions about the proposed herbicide spraying operations tended to overestimate the doses workers and the public would be likely to receive. The way herbicide toxicity information was used to judge risks based on effects seen in the most sensitive laboratory test animals tended to make that part of the risk assessment conservative. This conservatism, both in estimating exposures and in setting toxicity levels, when combined to judge risks, led to an exaggeration of the real risks of the vegetation management program to err on the side of protecting human health.

Risk Assessment Conclusions

The risk assessment indicated that risks to the public of systemic or reproductive toxic effects from routine spraying operations are very low for all 16 of the proposed herbicides. The ratio between the safe lab animal doses and the estimated public exposures was 150 to 1 or greater, giving a large margin-of-safety. The possibility of toxic effects increases when the public are assumed to be exposed as a result of accidents, however, the real risks are also low here because of the extreme unlikelihood of an accident directly exposing any member of the public.

Risks to workers are higher than those of the public both in routine operations and as a result of accidents. Workers have a far greater chance of being exposed than any member of the public and are likely to get higher doses than the public when they are exposed.

Cancer risks for the proposed herbicides are low. Available laboratory evidence indicates that dalapon, dicamba, diuron, fosamine, hexazinone, simazine, tebuthiuron, and triclopyr do not cause cancer. A cancer risk analysis was conducted for the eight herbicides that showed positive or questionable responses in laboratory cancer studies. The analysis was based on up to 30 estimated realistic and worst case lifetime exposures to the public assuming single and multiple exposure sources. Results showed that for aerial applications the worst case cancer risk for 30 exposures from multiple sources is less than 3 in 10,000 for atrazine. For 2,4-D the worst case cancer risks are less than 2 in 100,000. The risk for picloram is never greater than 7 in 10 million. Cancer risks to workers who are exposed at higher levels more frequently are higher than the risks to the public.

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There appears to be little risk that the herbicides would cause heritable genetic mutations. Exposures of members of the public should be low if any occur at all. Available evidence indicates that bromacil, dicamba, fosamine, glyphosate, and hexazinone are not mutagenic. They tested negative in the majority of mutagenicity assays reported and were not positive in available cancer tests. No mutagenicity studies were reported for dalapon or diuron but they were not shown positive in cancer tests. There is conflicting evidence of mutagenicity for amitrole, asulam, atrazine, 2,4-D, 2,4-DP, picloram, simazine, tebuthiuron, and triclopyr due to positive results in a number of mutagenicity assays and in at least one cancer study. However, there is no strong evidence to indicate that any of these latter herbicides would be likely to cause heritable mutations at the levels of exposure that may occur in BLM's program.

Synergistic effects are not likely to occur since synergism rarely occurs with chemical mixtures. The herbicide mixtures that may be used in the BLM's program have not shown synergistic effects in humans that have used them in other applications although there is some evidence that mixtures of 2,4-D and picloram may cause skin irritation.

Cumulative effects are not likely to occur because none of the herbicides is persistent in the environment or in the human body, no member of the public is likely to be chronically exposed in BLM's program, and no one is likely to receive simultaneous exposures from these same herbicides used in any other programs in California.

The structure of the risk assessment, the ways in which risks tended to be exaggerated, and a summary of the risk assessment results are described below.

Risk Assessment Structure

The risk assessment consisted of three steps: a hazard analysis, an exposure analysis, and a risk analysis.

The hazard presented by a chemical pesticide is its inherent toxicity or poisonous quality that may cause brief, reversible effects such as nasal irritation or nausea in humans who receive small amounts, or that in the extreme case, may cause death. All chemicals are injurious to health at some level of intake; even commonly consumed items such as aspirin, table salt, and sugar. As shown in Table H-2, the herbicides examined in this risk assessment in general are less acutely toxic at a given dose than insecticides, fumigants, and many other common chemicals to lab test animals.

Exposure is the amount of pesticide in a person's immediate surroundings (in the air, on their skin, in their drinking water). The amount that enters their body--that is ingested, inhaled, or that passes through their skin, during a specified time period--is their dose. A person's dose is usually expressed in milligrams of chemical per kilogram of body weight (mg/kg).

Risk in the case of chemical pesticides is the possibility or likelihood, under a specified set of circumstances leading to a given exposure, that a

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person may experience any of the range of toxic effects described above. In BLM's program, it is the possibility of experiencing toxic effects because of an exposure to one of the 16 alternative herbicides.

The Hazard Analysis

In the hazard analysis, a review was made of toxicity studies in open literature and of publicly available summaries of proprietary data to determine the toxic properties of each herbicide. The hazard analysis included a review of relevant laboratory toxicity studies on acute (single dose), subchronic (short term dosing), and chronic (long-term or lifetime dosing) effects caused by exposures via dermal, inhalation, and ingestion routes. The hazard analysis results are summarized in Table H-24.

The oral LD_{50} in rats (the single dose that kills half the animals tested) is the generally acknowledged benchmark of the acute toxicity of a chemical. It is usually found at test doses that far exceed any that are liable to occur in the handling and use of the chemical by humans. The rat oral LD_{50}s for the 16 BLM herbicides are listed in Table H-24.

Long term animal studies (subchronic and chronic studies), lasting 90 days to 2 years for most tests, are used to establish safe levels for humans. The safe lab animal level is the no-observed-effect level (NOEL) in a long term study- the dose that a test animal can receive every day without ill effects. Additional safety factors are used to extrapolate from the safe animal dose to a safe human dose. The generally recognized safety factor is 100 based on a factor of 10 to move from animals to humans and a factor of 10 to account for variable responses in humans. Table H-24 lists systemic NOELs for each herbicide. A discussion of the animal studies and the choice of NOELs is given in the Appendix H risk assessment.

Reproductive toxicity studies determine whether a chemical will affect the fetus or mother during gestation and cause abortions or malformed offspring (teratogenesis). A separate NOEL for these effects has been set for the 16 BLM herbicides. These reproductive NOELs are listed in Table H-24.

For the herbicides that had positive cancer tests, a cancer potency value that relates the probability of tumor formation to increasing lifetime doses is the parameter of concern. Those values are listed in Table H-24 for amitrole, asulam, atrazine, bromacil, 2,4-D, 2,4-DP, glyphosate, and picloram.

No comparable value can be used to estimate the likelihood of a human developing heritable mutations so the risk of mutagenicity is considered only in a qualitative manner based on the results of mutagenicity assays and cancer tests.

The Exposure Analysis

Two human populations, workers and the general public, are at risk from herbicide applications. Worker personnel such as mixer/loaders and backpack sprayers are directly involved in treatment operations. Members of the public, including public land visitors and nearby residents, may be

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exposed to herbicide drift, to vegetation with herbicide residues, or to an accidental spraying. They could also eat food or drink water with herbicide residues.

The exposure analysis determined how high the exposures and resultant doses of workers and the public are likely to be from routine operations and possible accidents under BLM's proposed program. No analysis could consider all the possible circumstances of herbicide spraying, so scenarios were used that were simplified descriptions of spraying operations and potential routes of human exposure.

Four scenarios (helicopter, truck, backpack, and hand application) were used to estimate realistic worker doses in routine operations (routine-realistic scenarios). Four additional scenarios with the same methods of application were used to estimate the highest doses workers might get in routine operations (routine-worst case scenarios). The worker dose estimates were derived from actual worker field study data of 2,4-D doses found by urine analysis. These studies showed that inhalation exposure was a negligible contributor to a worker's total dose so no separate estimate of worker inhalation doses was made. Scenario dose estimates were adjusted for hours worked, application rate, and the different skin penetration rates of the other herbicides.

Three of the four routine-realistic scenarios (helicopter, truck, and backpack spraying) were used to estimate public doses. The same three routine-worst case scenarios were used to estimate the highest likely public doses. Because no studies of public exposure comparable to the worker studies were available, the public's doses were estimated by a mathematical accounting (modeling) of the movement and fate of each herbicide in the area of spraying to estimate exposure levels on their skin, on their food, and in their drinking water. As in the case of workers, inhalation exposures of the public were considered negligible and were not estimated.

Dermal doses from the smaller herbicide spray droplets drifting offsite and depositing on a person's skin or from brushing up against vegetation with drift residues were estimated. Doses to a person drinking water with herbicide residues and eating berries, deer meat, game bird meat, garden vegetables, and fish containing herbicide residues were also calculated.

Cumulative doses to five "example" members of the public- hikers, berry pickers, hunters, fishermen, and nearby residents- that receive doses simultaneously through several exposure routes were calculated.

Scenarios were also used to estimate worker and public doses from accidents. Worker accidents included a spill of concentrate or spray mix on their skin and a direct spraying. Public accidents included a direct spraying and drinking water from a pond or reservoir contaminated by a spill from a truck or helicopter.

The Risk Analysis

The risk analysis was conducted after the worker and public exposures were estimated. The scenario-based estimates of doses to workers and the public were compared with the toxicity levels detailed in the hazard analysis. These comparisons were used to determine the risk to humans under the specified circumstances of exposure.

For threshold effects, the doses were compared to no-observed-effect-levels (NOELs) determined in the most sensitive animal test species. A margin of safety (MOS), the animal NOEL divided by the smaller estimated human dose, was computed to relate the doses and effects seen in animals to estimated doses and possible effects in humans. For example, an animal NOEL of 20 mg/kg divided by an estimated human dose of 0.2 mg/kg gives an MOS of 100. A margin-of-safety of 100 is comparable to the 100-fold safety factor described in the Hazard Analysis section as being generally recognized as safe for humans. The larger the margin of safety (the smaller the estimated human dose compared to the animal NOEL), the lower the risk to human health.

When an estimated dose exceeded a NOEL the dose was divided by the NOEL and a minus sign was attached. The result was not a margin of safety but simply a negative ratio. A negative ratio did not necessarily lead to the conclusion that there would be human toxic effects since all of the NOELs used in the risk analysis are based on no-effect levels in long-term animal studies and the estimated doses are not likely to occur often. This applies particularly to doses that are not likely to occur more than once, such as those to the public. Doses that greatly exceeded the NOEL were also compared to the herbicide's acute LD_{50} to evaluate the risk of fatal effects.

Systemic effects were evaluated based on the lowest systemic NOEL found in a 2-year feeding study of dogs, rats, or mice (or from a subchronic study if that NOEL was lower). Reproductive effects were evaluated based on the lowest maternal, fetotoxic, or teratogenic NOEL found in a 3-generation reproductive study or in a teratology study.

A worst case analysis of cancer risk was conducted for the herbicides considered to be suspect human carcinogens--amitrole, asulam, atrazine, bromacil 2,4-D, 2,4-DP, glyphosate, and picloram--by comparing estimates of lifetime dose with cancer potency estimates derived in the Hazard Analysis. A worst case analysis was also conducted for those herbicides that had positive mutagenicity tests or those for which no data were available. The risk of these herbicides causing mutations was judged on a qualitative rather than a quantitative basis, with a statement of the probable risk based on the available evidence of mutagenicity and carcinogenicity.

Uncertainty Factors and the Exaggeration of Risks

A number of factors contributed to the uncertainty in the process of judging risks to human health in the vegetation management program, and in each of these cases, a series of conservative assumptions or factors were used that tended to exaggerate the risks.

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First, the safe herbicide doses established in the laboratory are the result of tests on laboratory animals, particularly rats and mice, where doses produce no observed effects. To allow for the uncertainty in extrapolating from NOELs in lab animals to safe levels for humans, the margin-of-safety approach was used as described previously. These extrapolations and MOS values cannot adequately define the range of sensitivity of individuals however. Some sensitive people may be affected by doses normally considered to be safe.

A second area of uncertainty is in judging the risk to human health of doses that may be received once or perhaps a few times in a person's life (accidental worker doses and all doses to the public fall in this category) by comparing those human doses to levels of the chemical that produced no ill effects in laboratory animals even though the animals received the doses daily in long term studies. The risk assessment uses the MOS approach discussed above in comparing one-time human doses to lifetime animal doses in all of these cases even though this leads to an exaggeration of the risks.

Another uncertainty is that all herbicide chemicals have not been tested for their effects on humans or animals for all situations which may affect health. Page H-8 addresses these data gaps and their importance to the analysis.

A different approach was required in assessing the risks to humans of chemicals that may cause cancer. Because the exact mechanisms and effective (threshold) doses that cause cancer are not known to scientists, chemicals that could cause cancer were assumed to have no threshold of effects and no margin of safety comparable to that used to judge the risks of systemic or reproductive effects. It was assumed that there was some risk of cancer no matter how small the dose.

Where there was evidence from a long term study that a herbicide could cause an increase in tumor formation with increasing doses, a cancer potency value was taken from the lab animal study and adjusted for the differences in metabolism and lifetime duration between the lab animals and humans. Data of this kind existed for amitrole, asulam, atrazine, bromacil, 2,4-D, 2,4-DP, glyphosate, and picloram. The cancer potency value multiplied by an estimated human lifetime dose provides an estimate of human cancer risk.

A number of factors in the cancer risk analysis tended to exaggerate risks. The cancer potency value used to compute the human lifetime risk was derived from tumor data on the test species and sex showing the highest rate of tumor formation with increasing dose. The mathematical model used to extrapolate from the lab tumor data to likely human risk was the most conservative of the models currently in use by the scientific community. In addition, the upper limit of the 95 percent confidence interval around this risk estimator was used instead of the average potency value.

Uncertainty was also involved in the estimation of the human doses liable to occur in herbicide use. The risk assessment overestimated doses to err on the side of safety. In reality, workers are likely to receive some low level doses because they work with the chemicals routinely. However, standard safety practices and the use of protective clothing should reduce their actual dose levels below those estimated in this analysis. The same is true of the doses from any spraying or spill accidents that might occur, since the normal procedure would be to wash immediately.

Should a member of the public actually receive a dose, it is unlikely to be as high a dose as estimated in this risk assessment. Normal safety practice and the remoteness of most treated areas limit the possibility of the public receiving any dose at all. Several aspects of the analysis tend to exaggerate the public doses. No herbicide degradation is assumed to occur and the public is not assumed to wash themselves or their food items after a spraying or to cook fish and game meat before they are consumed. They are assumed to consume water that has received herbicide from drift or from a spill immediately after the event. Thus, the way exposures to both workers and the public are estimated in this risk assessment and the way the toxicity information is used both tend to exaggerate the real risks, to err on the side of protecting human health.

RISKS OF SYSTEMIC AND REPRODUCTIVE EFFECTS

Risks to the Public from Routine Operations

Table H-25 summarizes the margin-of-safety results for the public for the 16 herbicides under both the routine-realistic and routine-worst case exposure scenarios.

Public Risks from Routine-Realistic Doses

Table H-25 shows that there are large margins of safety (greater than 150) for every category of public exposure--even cumulative exposures--under the routine-realistic scenario for all 16 proposed herbicides, except for amitrole which has the lowest MOS of 32. Because no member of the public should be exposed the majority of the time, these margins of safety mean that the public should suffer no adverse effects. This is true for all individuals including pregnant women and the vast majority of sensitive individuals.

Exposure routes presenting the lowest risk are direct dermal exposure to spray drift and eating animals or fish that have drift residues. The representative members of the public at greatest risk from multiple exposures are the nearby resident and the berrypicker. Persons at least risk are the hunter, hiker, and fisherman. These relationships hold for all 16 herbicides.

Although the routine-realistic scenarios represent what can happen under routine operations, the probability of people receiving the doses estimated here is low because there are no residents, hikers, fishermen, or berrypickers in the vicinity of the vast majority of treatment units and, as described previously, these scenarios use a number of conservative assumptions that tend to overestimate the size of the doses.

Public Risk from Routine-Worst Case Doses

The routine-worst case scenarios estimate the highest likely public exposure levels from routine herbicide applications in California. The events leading to the exposures described in Table H-25 have a very low probability of occurring. It is unlikely that anyone would receive a dose as high as those estimated here. Under these extreme assumptions, risk to individuals is very low except for people who receive multiple exposures from a 400-acre fixed wing application.

Table H-25 indicates that all margins of safety under the backpack and right-of-way routine-worst case scenarios are greater than 100 except for amitrole and diuron.

Margins of safety calculated for combined routes of exposure to 2,4-D and triclopyr range from 10 to 50 in the worst case aerial application. Chronic doses of 2,4-D, as predicted by this analysis, could affect the peripheral nervous system but, in most cases, these effects are reversible. People who chronically receive triclopyr doses as high as those predicted here could experience kidney problems. Because the margins of safety were computed by comparing acute exposures with chronic no-effect levels, the risk of occurrence of these effects can be considered relatively low.

The margins of safety computed in the worst case 400-acre aerial spraying scenario indicate that sensitive individuals could suffer some acute toxic effects from the predicted exposures to atrazine, 2,4-D, and triclopyr. For atrazine, all margins of safety less than 100 are greater than 50 except for a berrypicker who is dermally exposed for 4 hours, eats 0.9 pounds of berries and drinks a liter of water contaminated at the highest possible level. This person could experience some systemic effects. However, that is unlikely because these one-time doses are all more than 10,000 times lower than the LD_{50}. It should be noted that the systemic NOEL for atrazine is based on weight loss in dogs. Therefore, sensitive individuals could become ill and possibly experience stomach problems.

The probability of someone receiving a dose as high as those predicted under the routine-worst case scenarios is negligible because these scenarios assume that a number of unlikely events occur simultaneously. The probability of someone receiving a dose as high as is predicted here is on the order of 1 in 1 million. The Forest Service's experiences in these operations indicate that the probability of the scenario events occurring simultaneously is even lower.

Public Risk from Accidental Doses

Table H-26 summarizes the risk to the public from direct exposure to aerial applications or from eating food or drinking water that has been directly hit at the highest application rate. The relatively low margins of safety for amitrole, atrazine, bromacil, 2,4-D, diuron, and triclopyr indicate that people exposed to a direct aerial application or exposed to items that received the highest application rate could experience some toxic effects. The extent of effects would depend upon their duration of exposure and any precautionary measures that were taken. For example, if people gathered a bushel of berries from a spray area and did not wash them but froze them and then ate them every day for a month, they would probably feel ill. However, if people bathed after being in the forest or washed food items before eating them, the doses would drop (and thus increase the margins of safety) substantially.

It must be emphasized that these are one-time, rather than repeat or chronic, exposures and that the comparison of these doses with the acute LD_{50}s shows that no one is at risk of fatal effects. Complete margins of safety computed for each chemical and application under the accidental worst-case scenarios are presented in the Appendix H risk assessment.

Worker Risk from Routine-Realistic Doses

In the routine-realistic scenarios, all categories of workers applying asulam or picloram have MOSs greater than 100. This indicates that even workers chronically exposed to these herbicides should suffer no ill effects. As shown in Appendix H Tables H-27 to 28, backpack sprayers are at greatest risk based on comparisons of estimated doses with systemic and reproductive NOELs. Except for asulam and picloram, all backpack sprayers had MOSs less than 100. Doses of atrazine, 2,4-D, and triclopyr to backpack sprayers gave MOSs less than 10; and in the case of diuron, the dose exceeds the NOEL. This means that unprotected sensitive workers may experience some toxic effects from routinely applying these herbicides in certain situations. The doses and margins of safety are based on 6 hours per day of exposure. Any reduction in the time of exposure would reduce the dose and increase the margin of safety proportionately.

Diuron appears to be the herbicide presenting the greatest risk from repeated exposures to other types of workers. Backpack sprayers using diuron in the routine realistic scenario receive a dose that is greater than the systemic NOEL. Diuron systemic MOSs for hack-and-squirt applicators are less than 10 in the routine realistic case.

2,4-D and amitrole present the next highest long-term risk. Backpack sprayers using amitrole and 2,4-D in the routine-realistic scenarios receive doses that have systemic margins of safety less than 10. Other workers using 2,4-D and amitrole also have MOSs less than 50.

Triclopyr has at least 4 margins of safety for workers (including those for backpack sprayers) that are less than 100.

Protective clothing can substantially reduce worker exposure by 27 to 99 percent as shown in a number of relevant field studies. Margins of safety calculated for routine-realistic and routine-worst case exposure to workers wearing protective clothing are presented in the Appendix H Tables H-27 and H-28.

Worker Risk from Routine-Worst Case Doses

Tables H-29 and 30 show backpack sprayers using amitrole, diuron, 2,4-D, or triclopyr in the routine-worst case scenario receive doses that exceed their respective systemic NOELs. In addition, doses calculated for truck applicators and hack-and-squirt applicators using diuron exceed the systemic NOEL. Margins of safety for the reproductive NOELs are much higher. No applicator dose exceeds the reproductive NOEL for any herbicide in any situation.

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All categories of workers, except the aerial supervisor and observer, have margins of safety less than 10 for at least one of the herbicides. Picloram and asulam are the only herbicides that always have margins of safety greater than 20 for all categories of workers.

The vast majority of the time workers will be receiving doses less than those predicted in the routine-worst case scenario. The probability of workers receiving repeated daily doses as high as predicted here is less than 1 in 1,000.

Risk to Workers from Spilling Concentrate or Spray Mix on Their Skin

The doses estimated here are based on dermal penetration levels derived in studies over many days; these chemicals do not penetrate the skin immediately but over a considerable period of time. Workers would have to ignore their own safety and not wash the chemical off to receive doses as high as predicted in these accidents.

For workers who spill a pint of concentrate or spray mix on their skin there is some certainty that, with the exception of picloram, they would experience acute toxic effects if they did not wash it off. The modeling used in the analysis assumed that a certain percentage of the herbicide penetrates the skin instantaneously. In reality, the penetration through skin occurs over a period of many hours. In the case of a spill of a pint of concentrate, many of the doses approach the LD_{50}. This represents a clear risk of severe toxic effects if the herbicide is not washed off. There is some possibility that the damage caused by such a large acute dose could cause long-term damage to vital organs. There have also been rare instances in which limited exposure to 2,4-D has been reported to cause permanent nerve damage. The dose and the risk is much greater for spills of concentrate than it is for the spray mix but, again, it is highly unlikely that a worker would allow the chemical to penetrate his skin for any period of time. The Appendix H Table H-31 risk assessment presents the complete listing of MOSs and comparisons to LD_{50}s for each herbicide.

Risk to Workers and the Public from Large Spill Accidents

Table H-32 summarizes the margins-of-safety for people drinking one liter of water contaminated by a large spill of herbicide from a helicopter or truck. Most drinking water reservoirs would dilute the herbicide below no-observable-effect levels in a relatively short period of time. BLM, in addition to EPA and the states, has procedures to minimize the risk to human health should a spill of this magnitude occur in or on the vicinity of a drinking water reservoir. When the spill has been diluted the risk to members of the public should be much lower.

Spills into a small, stagnant pond would result in significantly higher doses and, in the event of a truck spill of 2,000 gallons would constitute a risk of chronic effects if members of the public continued to drink from it. Spill accidents occur only very rarely; most recorded spills have involved 30 gallons or less of chemical; so the chances of this type of chronic exposure are negligible. BLM has detailed spill prevention and clean up procedures that would attempt to ensure that no member of the public was chronically exposed to a spill of this magnitude.

CANCER RISK

Cancer risks for atrazine, asulam, 2,4-D, glyphosate, and picloram were calculated based on a variety of conservative assumptions that are likely to overestimate the risks. These assumptions outlined previously are described in detail in the Appendix H risk assessment.

Cancer risk for the general public was calculated for a single exposure, and for 30 exposures over a lifetime. The approximate cancer risks to the public for the aerial routine-realistic scenario are shown in Table H-34. (See Attachment C for the presentation of cancer risks to the public for the other routine exposure scenarios.) The risk of cancer due to any of the routes of exposure in the typical aerial spraying scenario is less than 1 in 10 million risk when using atrazine. For 2,4-D, and picloram, none of the routes of exposure in any scenario results in a cancer risk greater than about 1 in 100 million, per exposure.

Cancer risk to workers has been calculated for an expected case assuming 5 years of employment in herbicide application, and an average number of days of spraying per year. The average number of exposures per lifetime was estimated to range from 30 to 70. The risk has been calculated in the extreme case assuming 30 years of employment and a total of 208 to 480 exposures. It is very unlikely that a worker would apply herbicides on the number of days assumed in the worst case. (Cancer risk to workers for the accidental-worst case scenario is shown in Table H-36.) The risks for each herbicide were calculated assuming that only that herbicide was used. The highest risks for workers involve atrazine and 2,4-DP use. The lifetime cancer risk to a backpack sprayer using only atrazine or 2,4-DP is about 1 in 10,000 in the expected case. In the worst case the risk is greater than 1 in 1,000. The risk is much less for the other chemicals. The highest risk for 2,4-D is about 1 in 100,000 for backpack spraying in the expected case, and in the extreme case the greatest risk is about 1 in 10,000. Workers using asulam in the extreme case have a lifetime cancer risk of less than 1 in 100,000 in all worker categories. The risk of picloram or glyphosate use is even less for all worker categories. The risks in the expected case never exceed 1 in 10 million.

Cancer risks calculated for exposures due to accidental spraying are shown in C-165. Among the chemicals, the greatest risk for a single exposure is about 8 in 100,000 exposure to amitrole. Multiple incidents could be expected to result in cumulative risks. Cancer risks calculated for spill situations are also shown in C-166.

The greatest risks are for spills of herbicide concentrate directly onto clothing and skin. Workers are at the greatest risk for this type of accident. The tabled values assume that most of a person's skin has been contacted by the solution, and cleanup does not occur for several hours. This is certainly contrary to standard practice. A spill of 2,4-D concentrate onto a person gives a risk of about 1 in 10,000, and a spill of spray mixture gives a lesser risk of about 5 in 100,000. The risk of cancer due to spills of asulam is about 5 in 100,000 for the concentrate and 4 in 1 million for the spray mixture. A spill of picloram or glyphosate concentrate gives a risk of 2 in 1 million or less. Cancer risks arising from even major spills into drinking water supplies are similar. A 100-gallon helicopter load of 2,4-D dumped into a 1-acre pond would lead to a risk of cancer of not more than 8 in 100 million for a person drinking a liter of the water. If a 1,000-gallon tank truck of mixture were spilled into a small pond, the risk for 2,4-D would be less than 2 in 1 million.

RISK OF HERITABLE MUTATIONS

No human studies are available that associate any of the herbicides with heritable mutations. No risk assessments that quantify the probability of mutations are available in the literature or from EPA. Laboratory studies constitute the best available information on mutagenic potential. Results of the mutagenicity assays conducted on the 16 herbicides are summarized in Table H-5.

Asulam and glyphosate tested negative for mutagenicity in all assays conducted, and thus can be considered to pose no mutagenic risk.

While amitrole and bromacil have tested negative for mutagenicity they have shown some oncogenicity, but EPA says this does not indicate they are mutagenic. Fosamine, hexazinone, simazine, and triclopyr were nonmutagenic in the great majority of assays conducted and were nononcogenic in all of the carcinogenicity tests performed; therefore, it can be assumed that their mutagenic risk is slight to negligible. Dicamba was nonmutagenic in most of the assays performed and no oncogenicity was found in several long-term studies. EPA (1985d) has classified the chronic studies as "inadequate to evaluate the oncogenic potential of dicamba." Due to the bulk of negative results, dicamba can be considered as a mutagen in the worst case analysis but the mutagenic hazard would be extremely limited.

No validated mutagenicity studies have been conducted for dalapon or diuron. The worst case assumption is that all of these chemicals are mutagenic. The probability dalapon or diuron causes heritable mutations is low because they have not been shown to cause cancer in any long term studies.

The negative oncogenic studies for diuron were classified by EPA (1985d) as inadequate to determine carcinogenic potential to mammalian organisms. The lack of positive results in any mutagenic or oncogenic tests with diuron suggests that diuron would present only minute risk to humans as a mutagen.

Atrazine tested positive for mutagenicity in 15 of 33 assays. The worst case assumption is that atrazine is mutagenic. However, many of the positive results were achieved through tests that may not be relevant to evaluating mutagenic risk in humans. Some positive results in rodents were also achieved, but these in vivo responses were only observed at levels greater than 1,500 mg/kg body weight. These are exceptionally high levels and suggest that the degree of germ cell hazard from low levels of atrazine would be minimal at best.

For picloram, 2,4-D, 2,4-DP and tebuthiuron there have been only a few studies performed and these have indicated both positive and negative mutagenic potential. A number of comprehensive reviews of the 2,4-D mutagenic data have indicated that it does not pose significant risk of human gene mutations (USDA, 1984). 2,4-D has been shown to be nononcogenic in the two carcinogenicity studies that have been conducted. Based on a worst case estimate, the risk of heritable mutations from these chemicals would be no greater than the estimates of cancer risk.

SYNERGISTIC AND CUMULATIVE EFFECTS

Synergistic Effects

Synergistic effects of herbicides are those that occur when the combined effect of the two chemicals is much greater than the sum of the effects of each given alone. Based on the limited amount of data available on pesticide combinations, it is possible but very unlikely that synergistic effects could occur as a result of exposure to two or more of the herbicides.

Simultaneous exposure to more than one chemical is likely in cases where those chemicals are combined in a single spray mixture. Although the great majority of vegetation control projects in the Region involve only a single herbicide, a number of acres are treated with mixtures of herbicides. However, the only herbicide mixtures used are combinations that have been approved for use by the Environmental Protection Agency.

The toxic effects of many of the possible herbicide combinations have not been studied. The first priority in toxicity testing is to study the effects of the herbicides individually, and this type of information is not yet sufficient in some cases. Moreover, the combinations that could be studied are too numerous to be examined. The combinations of interest include not only combinations of 2 or more of the 16 herbicides, but also combinations of the herbicides with other chemicals, such as insecticides, that exist in the environment.

Based on a review of acute oral LD_{50}s for mixtures of 2 or more of the 16 herbicides, no synergistic effects were found. In no case is the mixture of two herbicides more acutely toxic than any of the constituents. For example, a mixture of 2,4-D and dicamba resulted in a NOEL of 1,847 mg/kg, with lower acute LD_{50} values reported for the technical grade of both mixture constituents (EPA, 1934e). Rat inhalation studies of formulations containing 2,4-D and picloram did not result in toxic effects (EPA, 1984q) although the combination of 2,4-D and picloram appeared to produce skin sensitization, while neither alone produces this effect. (EPA, 1984q).

It is unlikely that synergistic adverse effects could result from exposure to more than one herbicide applied in separate projects because herbicide residues in plants and soil are not expected to persist from one application to another, even for the more persistent herbicides. Silvicultural and range applications are not annual; there are typically many years between applications. None of the 16 herbicides accumulates in human tissues, so exposure of an individual to 2 herbicides at different times would be unlikely to cause simultaneous residues within the body.

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Exposures to the herbicides, especially for the public, are normally quite small. The greater exposures considered in the routine-worst case scenarios would occur only very infrequently, and the probability of the accidental exposures is extremely low. Because the probability of a large exposure is small for any one chemical, the probability of large exposures simultaneously to multiple chemicals is negligible.

Cumulative Effects

No one individual member of the public is likely to receive repeated exposures to any of the herbicides because of the remoteness of most treatment units, the widely spaced timing of repeated treatments, and the use of a variety of herbicides for different purposes. In addition, the precautions taken by the BLM in their treatment operations make any dose at all to the public quite unlikely. This risk assessment used the lowest NOELs found in chronic animal laboratory studies for comparison with estimated human doses. The risk analysis results showed that, except for triclopyr, margins of safety for the public from realistic treatment scenarios are greater than 200. Thus, members of the public could receive doses of these herbicides repeatedly over the years, even though the chance of receiving multiple doses is negligible, and still not suffer toxic effects. Some individuals who may be particularly sensitive to triclopyr may experience ill effects but, again, this should occur only in the unusual circumstance of repeated doses. Compared to the levels of exposure to the pesticides used in agriculture and related commercial operations in California, the exposures to humans from BLM operations from year to year would be insignificant. Therefore, cumulative effects on the public should be negligible.

Cumulative effects on workers have been considered throughout this analysis. The risk of workers experiencing toxic effects, including cancer, assumes that they are chronically exposed to these herbicides. Backpack applicators are at greatest risk from cumulative effects.

UNAVOIDABLE ADVERSE IMPACTS

The unavoidable adverse impacts which result from implementation of this program will not be identifiable for the most part until the site-specific projects are identified and EAs done on those specific projects. Some generalized unavoidable adverse impacts can be identified at this time, but these impacts will not necessarily occur in all vegetation control projects as each project is different as are sites to be treated and many of these impacts may be mitigated in some cases.

Short-term air quality impacts from prescribed burns and mechanical methods are expected but standards are not expected to be violated under all alternatives. Under Alternatives 2 and 3 allowable annual timber harvest would decline as would economic returns from timber sales. With vegetation management visual resource quality would be degraded in some cases to a slight degree and cultural resources could be accidentally damaged by mechanical methods. Adverse impacts to social well being would occur no matter which alternative is implemented since with herbicide use some groups would perceive danger from chemical use and with no herbicide use others would be impacted by perceived inaction to control nondesirable vegetation.

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SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

Implementation of the proposed vegetation control program would have some short-term effects on the productivity of treated sites. The areas to be treated are currently used for forest production, grazing, wildlife, watershed purposes, and recreation. In the short-term, the loss of target and nontarget vegetation would cause temporary loss of food, cover, and other habitat requirements for wildlife, wild horses and livestock.

Continued use of these areas for these purposes is contingent on future productivity. Controlling the spread of vegetation species that are not conducive to proper forest, grazing, wildlife, recreation, fuels or watershed management would ensure future productivity of these areas. Productivity of the treated areas would be enhanced and increased in the long term.

IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

Irretrievably committed resources include the loss of some types of vegetation with the implementation of all alternatives.

BENEFIT-COST ANALYSIS OF RANGELAND IMPROVEMENT PROJECTS

The level and effectiveness of range vegetation control on BLM land in the EIS area affects the amount of available forage that could be leased by the Bureau as well as direct and indirect effects on other resources and their values, such as recreation use, wildlife populations, and soil and water protection. A change in the use of these resources would affect the investment analysis. Each of the uses of BLM land has a value; when uses change (either increase or decrease), the mix of benefits and costs changes, affecting the return on the investment.

A primary determinant of whether a range investment project should be undertaken is its economic profitability, the weighing of future dollar benefits against future dollar costs. Benefit-cost ratio and internal rate of return are two investment criteria that can be used to evaluate range projects. For any investment decision, land managers must look at all costs and all benefits. Costs include project preparation time, cost of the project itself including labor and equipment, administrative costs, follow-up time, and monitoring time, plus any maintenance during the life of the project. Consideration of any salvage value is also necessary. Benefits may include, but are not limited to, increases in available forage, wildlife populations, and recreation activities and reductions in erosion.

Land managers look carefully at what kinds of investment packages could yield the greatest return while also meeting grazing management objectives. Investment packages are designed for grazing allotments and can consist of a combination of projects such as utilizing different types of control methods (chemical, mechanical, or fire), seeding the area, developing springs, or building reservoirs. BLM uses a computer program ("SageRam," BLM Manual Handbook H-1743-1) to show estimated costs and benefits over the life of the proposed investment package and to show the benefit-cost ratio and internal rate of return for the allotment.

CUMULATIVE IMPACTS

Cumulative impacts would be those impacts which result from the additive effects of many small, possibly insignificant impacts from this program or because of impacts from this program combining with effects from other nonrelated actions in nearby locations. The most easily identifiable cumulative impact under the Proposed Action is that vegetation production will be managed and maintained under the guidelines decided upon by the local land use plans. Meeting these guidelines is less likely under the alternatives due to the manager having fewer tools to utilize. Other possible cumulative impacts are less certain. Undesirable cumulative effects such as water quality degradation, changes to soils, loss of nontarget plants, and impacts to wildlife and humans are all possible but unlikely due to the scope and design of the Proposed Action. This is because areas to be treated are small in relation to the total EIS area and treatments are not to be repetitive. The chemicals are all biodegradable, would break down over time, and would usually be cleared from the natural system prior to any possible reapplication, eliminating the possible additive effects.

While cumulative effects from chemical use are very unlikely, they would be even less likely under Alternative 2 and nonexistent under Alternative 3. However, these differences would be likely to be so slight they could not be measured.

Prescribed burning and mechanical and manual techniques are also unlikely to create significant cumulative effects due to the large total area the relatively small area of projects will be spread throughout. Prescribed burning although affecting the largest area may have the least likely cumulative impact due to the fire dependent ecology of much of the EIS area.

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CHAPTER 4

CONSULTATION & COORDINATION

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CHAPTER 4

LIST OF AGENCIES, ORGANIZATIONS AND PERSONS TO WHOM COPIES OF THE STATEMENT ARE SENT

Comments on the draft EIS were requested from the following:

FEDERAL AGENCIES

Advisory Council on Historic Preservation

Department of Agriculture - U.S. Forest Service Region 5
- Soil Conservation Service

Department of Commerce - National Marine Fisheries Service

Department of Defense - U.S. Army Corps of Engineers

Department of the Interior - Fish & Wildlife Service
- Bureau of Indian Affairs
- Geological Survey
- Bureau of Mines
- Bureau of Reclamation
- National Park Service

Environmental Protection Agency

STATE AND LOCAL GOVERNMENT

California

Office of Planning and Research (State Clearinghouse)
Department of Food and Agriculture
County Agriculture Commissioners
Department of Forestry and Fire Protection
State Water Resources Control Board
Department of Water Resources
Department of Fish and Game
Department of Parks and Recreation
Department of Transportation
California State Historic Preservation Officer
County of Orange
Riverside County Planning Department
Native American Heritage Commission
Kern County Department of Planning and Development Services
Los Angeles Department of Water and Power
Inyo County Planning Department
Modoc County Planning Department

Nevada

Department of Agriculture
Department of Wildlife

Interest Groups and Companies (partial list)

Humboldt State University
Animal Protection Institute of America
California Native Plant Society
Sierra Club (Several Chapters)
SAFE Alternatives for our Forest Environment
Southern California Edison
Environmental Health Coalition
Environmental Protection Information Center
California Coalition for Alternatives to Pesticides
Defenders of Wildlife
Western Timber Association
Louisiana-Pacific Corporation
Citizens for Mojave National Park
Sierra Pacific Industries
National Resources Defense Council
California Energy Company
Mattole Watershed Salmon Support Group
Pacific Gas & Electric
Pacific Power & Light
Sierra Club Legal Defense Fund, Inc.
Cooperative Extension, University of California
Environmental Science Association
Environmental Defense Fund
National Forest Products Association
Audubon Society Chapters

LIST OF PREPARERS

Though individuals have primary responsibility for preparing sections of an EIS, the document is an interdisciplinary team effort. In addition, internal review of the document occurs throughout preparation. Specialists at the BLM's Resource Area, District, State & Washington Offices provide information and conduct review of the document. Contributions by individual preparers may be subject to revision by other BLM specialists and by management during the internal review.

Name	Primary Responsibility	Related Professional Experience
Mark Blakeslee	Team Leader	Hydrologist, 11 yrs.
Bruce Dawson	Vegetation, Grazing	Range Conservationist 9 yrs.
Mike Ferguson	Wildlife, Threatened & Endangered Species	Wildlife Biologist 11 yrs.
John Key	Climate, Geology, Soils and Water Resources	Soil Scientist, 13 yrs.
Dan Marlatt	Forestry	Forester, 25 yrs.
Sheri Olendorff	Word Processing	Word Processing Operator, Editorial Assistant, 6 yrs.

The Human Health Risk Assessment (Appendix H) and Wildlife and Aquatic Organism Risk Assessment (Appendix L) were adapted from reports prepared for BLM and the USFS through contracts with Labat-Anderson, Inc. The list of preparers for the Human Health Risk Assessment can be found in Supplement to the Western Oregon Program-Management of Competing Vegetation, DEIS; USDI, BLM 1986.

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PUBLIC COMMENTS ON DRAFT EIS

Comments on the Draft EIS were received from over 300 individuals, groups or agencies. Within the Final EIS 52 letters are reproduced and comments are specifically noted and responded to in the following pages. Letters not reproduced either are represented by similar letters which have been reproduced or did not provide detailed comments requiring BLM response. While most letters simply stating an opinion one way or another are not included in this final a few sample opinion letters have been included as examples and will be referred to in the following discussion.

GENERAL OPINION SUMMARY

An overwhelming majority of letter writers opposed any use of herbicides. Typical of these feelings are comment letters number 1, 9, 10, 12, 13, 16, 17, 21, and 24. These people felt that herbicide risks to human health and the environment should preclude their use.

Many people opposed to herbicide use stressed that any vegetation control should be accomplished by manual techniques because this would create jobs, put convicts or youths to work, and promote the local economy.

There were a few letters which stated that no vegetation management was necessary as well as a few letters opposed to prescribed burns.

For the most part the source of the comments was very localized. Most comments were from the North Coast area (Fort Bragg, Eureka, Arcata, and King Range locale). Letters from this area were overwhelmingly opposed to herbicide use and supported manual vegetation control.

Many strongly anti-herbicide use letters were also received from Shingletown. Most of the Shingletown letters were form letters or petitions which had been printed in a local paper. Another area of strong herbicide opposition was the northern Sierra foothills (Sonora, Grass Valley, and Nevada City).

Generally the other letters were received from widely scattered locations throughout the state, and were more mixed in the general standing on herbicides than the letters from the three locations identified above.

RESPONSE TO COMMENTS

Each letter reproduced in the final has been assigned an index number and individual comments within the letter were also numbered. Responses follow the complete comment letter and are individually numbered using the letter number and comment number. Any appendix material enclosed with a comment is not included herein but may be obtained from the California State Office.

COMMENT LETTERS

Letter No.	Individual, Agency, or Organization and City
1.	Martin Smukler, M.D. - Arcata
2.	Sierra Club Redwood Chapter - Fort Bragg
3.	Animal Protection Institute of America - Sacramento
4.	Larry Ballew - Ahwahnee
5.	Chris Conrad - Standard
6.	Jackson Valley Watershed Coalition, Eric Swanson - Branscomb
7.	Susan Smith - San Francisco
8.	Bureau of Reclamation - Boulder City, NV
9.	Citizens for Mojave National Park - Barstow
10.	Irene Koch-Marcus - Redding
11.	Inyo-Mono County
12.	Judy Lee Ramsey - Redway
13.	Derham Giuliani - Big Pine
14.	Los Angeles Department of Water and Power
15.	Kern County
16.	Kurt Newman - Arcata
17.	Mary Ann Czermak - Palo Cedro
18.	CA Association of 4 WD Clubs - Sacramento
19.	Southern California Edison - Long Beach
20.	State of California
21.	Deborah Mokma - McKinleyville
22.	Scott Rappaport - Arcata
23.	Harold Heady - U.C. Berkeley
24.	Rebecca Sherania - Redway
25.	SAFE, Safe Alternatives for our Forest Environment - Hayfork
26.	Central Sierra Audubon - Sonora
27.	Tuolumne Chapter Sierra Club - Sonora
28.	CCAP, California Coalition for Alternatives to Pesticides - Arcata
29.	Donald and Phyllis Gernes - Garden Valley
30.	Denise Grover - Redway
31.	Toxics Subcommittee of the North Coast Greens - Comptche
32.	Jackson Valley Watershed Coalition, Donald Cameron - Branscomb
33.	Sierra Club Redwood Chapter North Group - Arcata
34.	The Rural Institute - Willits
35.	EPIC, Environmental Protection Information Center, Cecelia Gregori - Garberville
36.	D. Scott - Mendocino
37.	Roger and Karen High - Nevada City
38.	California Wilderness Coalition - Davis
39.	Public Health Service, Center for Disease Control - Atlanta, GA
40.	Deanna McNallen - Ft. Dick
41.	EPIC, Robert Sutherland - Redway
42.	J.A. Ferrara - Covelo
43.	EBC Company - Willits
44.	U.S. Geological Survey - Reston, VA
45.	Pacific Gas and Electric - San Francisco
46.	U.S. Fish and Wildlife Service - Portland, OR
47.	U.S. EPA - San Francisco

Letter No.	Individual, Agency, or Organization and City
48.	Trinity County
49.	National Park Service - Western Region
50.	GASP, Group for Alternatives to Spreading Poisons - Nevada City
51.	Mattole Restoration Council - Garberville
52.	State of Nevada

Martin Smukler, M.D.
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December 26, 1987

California State Director
Bureau of Land Management
2800 Cottage Way
Sacramento, CA

Dear Director:

We are submitting comments on the California Vegetation Management DEIS as it pertains to Humboldt County. As health care providers we are conserned about the possible, and in some cases
4-7 probable, health risks of the aerial spraying of pesticides. We believe it is immoral to justify the spraying with the rationale that the financial benefits out weigh any perceived danger to the health of the public. This is especially true when there are alternatives which are not only safe but will provide jobs. Why not use manual release on public lands and charge the lumber companies a little more money to pay for it? Certainly they can afford this more than the public can afford increased ill health.

Orleen Smukler, RN
Martin Smukler, M.D.

You are a person not a disease

BEST CO

SIERRA CLUB - REDWOOD CHAPTER

~~P. O. Box 466, Santa Rosa, Ca. 95402~~

SIERRA CLUB - REDWOOD CHAPTER
CONSERVATION COMMITTEE
Ron Guenther
29900 Highway 20
Fort Bragg, California 95437

December 30, 1987

California State Director
Bureau of Land Management (932)
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, California 95825

RE: California Vegetation Management Draft Environmental Impact Statement (DEIS)

Dear Sir:

The following are Sierra Club - Redwood Chapter comments on the California Vegetation Management DEIS. We have these concerns for this document:

2-1 1) The lack of justification for the use of toxic pesticides on public lands;

2-2 2) Lack of data base leading to inaccurate evaluation of pesticide hazards to human and other life;

2-3 3) Lack of documented need for vegetation management;

2-4 4) Lack of legally required concern for impacts to wildlife;

2-5 5) Failure to adequately consider widespread and increasing public concern for the use of toxic pesticides on public lands;

6) Generally incomplete information about the program as exemplified by 1),3), and 5) above;

7) General inability to accurately determine impacts as exemplified by 2), and 4) above.

We request that these concerns be completely addressed, evaluated, and responded to in the Final EIS. Thank you for your consideration of our many concerns for BLM's California Vegetation Management Program.

Ron Guenther
Conservation Chair
For the Sierra Club - Redwood Chapter

Copies to: Mendocino-Lake Group, Chapter Secretary

. . . To explore, enjoy and preserve the nation's forests, waters, wildlife, and wilderness . . .

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Response to Comment Letter 2

2-1 A statement has been added to page 1-6.

2-2 A very large data base was used to develop Appendix H and L as cited in the references.

2-3 Need is discussed on page 1-1.

2-4 Wildlife impacts are discussed in Chapter 3 and chemical effects are further addressed in Appendix L.

2-5 These concerns are discussed on pages 2-21 through 2-23.

ANIMAL
PROTECTION
INSTITUTE
OF AMERICA.

6130 Freeport Boulevard
P.O. Box 22505
Sacramento, CA 95822
(916) 422-1921
TWX 910 367 2376 API SAC

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January 6, 1988

California State Director
Bureau of Land Management
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

Dear Mr. Blakeslee:

Thank you for granting the Animal Protection Institute this opportunity to comment on the Draft Vegetation Management Environmental Impact Statement. We appreciate the amount of work that has gone into compiling this document and regret that our comments are mostly negative.

3-1 We're disappointed that the EIS does not include an alternative which addresses the cause of noxious weed or invader species takeover in given areas. If we were able to examine cause then the control options would include methods not considered in the current draft EIS. Because livestock overgrazing has long been considered the primary cause of a declining range trend, we strenuously object to the interpretation of sustained yield principles expressed as the necessity of meeting "sustained yield production levels called for by these (resource management plans) management decisions..."(P.1-1, p.3). The implication is that BLM's job is to provide resources for users rather than protect resources from users by controlling and restricting usage through the permit system.

It has been our experience, that there is a tacit implication that livestock are seen by BLM as a public land resource when in actuality the resource is the forage and livestock usage of forage is to be controlled by permit as to numbers, season of use, and species by BLM. We object to vegetation conversion to increase forage productivity in principle; and believe vegetation control can be achieved by a choice of foraging species--at least in given areas. The failure to exercise this statutory control of

continued ....

Chairman of the Board KENNETH E. GUERRERO **Vice Chairman** DUF FISCHER **Secretary** LUANA GRIMLEY **Directors** COLETTE C. [illegible] GWENDOLYN MAY ROWLAND MITCHELL RICHARD WEMPE **Honorary Vice-President** KIM NOVAK **National Advisory Board** ROBERT BROWN [illegible] Farming MERRILL A. BURT D.V.M. Veterinary Medicine NED BUYUKMIHCI V.M.D. Institutional Veterinary Medicine DONALD E. DOYLE M.D. [illegible] Science Advisor BRUCE MAX FELDMANN D.V.M. Veterinary Medicine and Pet Population MARJORIE GUERRERO Humane Education MRS. [illegible] HARRISON Southwest Regional Activities SHIRLEY McGREAL PH.D. Primate Specialist JOYCE S.A. TISCHLER J.D. Animal Rights and the Law [illegible] [illegible] and Aquariums MRS. RALPH YOUNGDALE Publicity and Promotions **Foreign Advisors** ANGUS O. McLAREN [illegible] South Africa MRS. [illegible] [illegible] Canada MICHAEL A. [illegible] **In Memoriam** VELMA [illegible] HARRY [illegible]

Foreign Offices
GENEVA, SWITZERLAND
STUTTGART, GERMANY

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users and the failure to include it as an alternative management option, severely restricts the full expression of public input on possible vegetation management practices and policies. While this species-control possibility may not apply to manzanita or chapparal control in steep and rugged canyons, the draft EIS does not distinguish the number of acres that would in fact fall into this category or compare the feasibility of various methods of control in different terrain situations. We believe different terrains should be individually considered. We regret the lack of maps in the EIS. Because there is such enormous diversity in the state, we question whether this programmatic EIS adequately examines the issue. 3-2

Our position is to strenuously object to the preferred alternative which will result in the highest level of soil erosion, water contamination, nontarget species eradication as well as presenting the highest human health risk and is, in addition, the costliest alternative. 3-3 The remaining two alternatives presented in the EIS are equally unacceptable. Nongame species have not been given major consideration and the EIS overall does not reflect the ecological approach required by the National Environmental Policy Act. 3-4 That should, we believe, include the interrelationships between animal species and between animals and plants as a factor to be considered as impacted by vegetation control methods. This, too, requires examining the impact regionally.

The Animal Protection Institute, with 170,000 members nationwide and a large California constituency, is more and more involved with the management of public land habitat as a major concern of our members. Most oppose the use of herbicides as a management option--whether by aerial spray or ground application. We believe "biological controls" should be categorized in such a way that there is a differentiation between grazing species and imported insects or micro-organisms rather than lumping them all into one classification. We urge that this additional alternative be added to the study. Again, thank you for this opportunity to express our concerns and objections.

Sincerely,

Nancy Whitaker
Program Assistant

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Response to Comment Letter 3

3-1 Analyzing the land use plan decisions already made is beyond the scope of this EIS as noted on page 1-1.

3-2 Individual EAs will be done on each individual proposed vegetation control project.

3-3 See Table 1-4, erosion is not greatest under the Proposed Action and while costlier it may have the highest production.

3-4 Expected impacts have been addressed and site-specific interrelationships will be addressed later when specific projects are proposed. Nongame species are given full consideration in Chapters 2 and 3 especially as relates to threatened and endangered (T&E) and sensitive species

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"The Perfect
Timberland Prescription"

LARRY BALLEW
Forest Consultant

*REFORESTATION
SPECIALIST*

*PESTICIDE USE
ADVISOR*

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1	SD
2	ASD
	ADMIN
3	RES
	OPER
	PA
	Minerals
	EEO

Action by
Surname by
Return to

December 22, 198

Mr. Ed Hastey, State Director
United States Department of the Interior
Bureau of Land Management
2800 Cottage Way
Sacramento, Ca 95825

Dear Ed,

Thank you for the opportunity to review and comment of the DEIS for California Vegetation Management programs. I am responding to the document as an adjacent landowner, cattle rancher, and Forest Consultant, who's clients include: Native Americans, BLM cattle permittees, timber interests, and persons who provide products and services to persons who are dependant on the management of the BLM holdings. These persons provide the very basic needs of the American people in the form of : food, fiber, and employment.

4-10

The following comments are listed by page number in the parent document.

Page 1-6:Chemical Methods.

4-1 I concure that no herbicide, except for the 16 mentioned, should be used without a risk assesment. Acceptable risk assessments conducted by other Federal agencies should be considered as satisfactory for inclusion in permitted list on BLM holdings. There are several new herbicides, ie "Oust" Herbicide and "Escort" Herbicide, manufactured by DuPont Company, which are being used on other Federal lands. These should be acceptable, without the BLM conducting a new completly independant document.

Page 1-8: Table 1-2 List of Herbicides by Trade Names

This table indicates what products will be used by trade names, which insures that the formulation does not include any unacceptable inert ingredients. This same statement applies to the trade names found in Table H-6, on page H-46.

4-2 Under the Herbicide Hexazinone, the folowing formulations should be added: "Velpar" Herbicide, "Velpar" L Herbicide, "Velpar" ULW Herbicide, "Velpar" RP Herbicide, and Pronone 10G.

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4-2 Under the Herbicide Diuron, the following formulation should be added: "Karmex" Herbicide.

Attached are some of the labels mentioned for your consideration.

Page 1-9: Proposed treatment by plant community. Table 1-3

You mention manual treament as the only proposed for the Juniper Woodland type. The Foresters and Range Managers at the DuPont Company have developed a method which is more efficient and cost effective. It is the use of "Velpar" L, with a spotgun applicator. Enclosed is a brochure on the method. It is used extensively throughout the United States for individual plant control in hardwoods, brush and juniper control. This system will replace the manual method in this type, and because of ease and cost will accelerate the rate of range impovement in this plant community. It will also create a larger industry in providing fuelwood and posts from the treated juniper.

4-3 This method of application needs to be addressed on page 1-10 along with other methods of ground application

Page 1-11: Prescribed Burning

We concur, that prescrible burning should take place and be accelerated. It should be mentioned herbicides or crushing should take place prior to burning to improve the dead fuel ratio. Resprouting following burning by oak species, and et al, more often cause a a greater decline in range values than before the burn. This requires more frequent burning to maintain values, which increases erosion and decreases forage values. Control of resprouting by the use of "Velpar" L, w/spotgun, significantly improves the efficiencey of the burn. This does not eliminate the oaks, but permits maintaining the desired stocking.

4-4 This will need to be addressed in other parts of the DEIS, including the section on Woodland type management.

Page 2-4 thru 2-8 and Table 2-1

4-5 The description of the plant communities in the Major Land Resource are nice broad descriptions, however, there are several other inclusions of other plant communities not included. This coupled with the mention of the type of appropriate vegetation control measure for the MLRA is overly restrictive. All needed methods of control should be available to the land manager regardless of MLRA.

Page 2-11: Forested Areas

46 With the exception of the fist sentence, in the next to last paragraph, this paragraph is in error or subject to professioanl criticism.

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I have evaluated many of the BLM holdings from Fresno/Bishop north to the Oregon border over the last 30 years. The majority of the forested areas are grossly inadaquately stock with desired trees, because of several past partial commercial harvests. Invasion of weed species in the understory has in most cases prevented adaquate stocking of natural seedlings. The current stand structure promotes more even-age mangement.

As your holdings are located on harsher, more arid sites, than oter Federal holdings, the need for weed control in the early phases of reforestation are greater. The third paragraph on page 2-12 more, more closely describes the situation.

Page 3-8: Chemical treatment

4-7 The chemical Hexazinone should be listed under herbicides used for site preparation. It is the most used by other Federal agencies in Forestry, and cosidered the most cost-effective by private timber holdings.

Some of the herbicides and specific trade names you mention by specified uses, are being withdrawn from California registration by the manufacturer. It was announced at the recent conference in Redding, Ca. that picloram is being withdrawn by Dow Chemical Co. There may be others.

Page 3-15: Impacts on Woodlands

4-11 Under Juniper Woodland refer to my comments on page 2.

4-8 Under Hardwood Woodlands you mention "no intent to control..". This is a major adverse impact on the range resources located in MLRA's: (15)Central California Cosat Range, (17) Sacramento and San Joaquin Valleys, (18) Sierra Nevada Foothills, and (19) southern California Coastal Plain.(Figure 2-1).

Control and management of hardwood species, density and size should be recommended, and the availablility of all tools, including herbicides, should be available to the land manager. Refer to my comments regarding page 1-11.

Page E-1: Analysis of program costs

In this comparison you have shown there is a difference in cost per acre by different Atlernatives. This is misleading, because the acres are different, and you have made not assigned a cost of no-treatment. Alternative 1 would still be the best, but by a greater margin. By not treating the 5,000+ acres per year under Alternative 2 and 3, are you still able to meet management objectives over several decades? 4-9

Page F-7 and F-12: Environmental Fates Chemicals

4-10 On page F-7, add the name "Karmex" Herbicide to the trade name.

On page F-12, list the names, "Velpar" Herbicide, "Velpar" RP, and "Velpar" ULW to the trade names.

Conclusion

On behalf of my clients and myself, we wish to thank you for the opportunity to review the DEIS. It is generally very complete, extremely readable and understandable by the lay person.

Although this is only one reponse, it represents the feelings of a great number of people and cross-section of the American public.

I suggest, being your organization has not used herbicides for several years, you enlist the free services of one of the chemical companies that have field representatives in forestry and range management to assist in training personel. I highly recommend Wm. "Bill" Seaman, DuPont Company, Chico:916-894-8795.

Professionally yours,

Larry E. Ballew

Larry Ballew
Forest Consultant

c.c: list of clients

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Response to Comment Letter 4

4-1 True, BLM will not duplicate existing acceptable risk assessments, we will reference those as we have for paraquat on page 1-6.

4-2 The lists are not meant to be all inclusive. Other herbicide brands satisfy the conditions but not all were listed, only a sample to let readers who may be more aware of the trade names know what could be used. From the information we presently have Velpar, Karmex, and Pronone 10G are OK for use. Velpar RP contains inerts of concern and may not be used. Velpar L is already on the list and we have no present information on Velpar ULW inerts.

4-3 The table on page 1-9 does not specifically list juniper control under herbicide uses, however in developing the table juniper control was included under the sagebrush community as the two are related in most areas of interest. We have also added spot gun to the listing of hand applied herbicides on page 1-10.

4-4 The use of herbicides to control sprouting in newly planted timber harvests is anticipated and covered. However, in most prescribed burn areas for wildlife and range purposes herbicide treatments after burns are not anticipated, as in most cases the young succulent brush provides exceptional browse for wildlife.

4-5 The broad plant communities are used to allow management flexibility and since specific project sites are not known at this time, are used as an attempt to identify where impacts can be expected.

4-6 The third paragraph on page 2-12 has been reworded and may address your concerns. In addition, due to the BLM multiple-use guidelines the minimum stocking levels acceptable to BLM are often less than desired for timber management alone. The need for reduction of vegetation competition with conifers is recognized as our main concern.

4-7 The list is not all inclusive. Those listed are only examples, any herbicide registered for a particular use may be considered for that use.

4-8 For the most part these woodlands are managed for their wildlife values and are therefore not proposed for treatment.

4-9 Page 1-4 identifies that Alternatives 2 and 3 would not meet present management objectives.

4-10 It is not our intention to attempt to list every brand which may be acceptable for use.

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SACRAMENTO, CALIFORNIA

January 8, 1988

California State Director
Bureau of Land Management
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

Dear Director,

I would like to comment on the recently released Draft Environmental Impact Statement for the California Vegetation Management program for the BLM.

I believe the DEIS is very complete in regards to herbicides and the public health risk assessment. There is very little risk to the general public to be associated with the application of herbicides to forested lands.

I am dissappointed, however, at the lack of management that will be applied to the 216,000 acres of capable and suitable timberlands in the state. The DEIS states that there will only be 900 acres of these lands treated with herbicides every year. Given the backlog of untreated plantations and the number of acres to be clearcut every year (700) this is an incredibly low total.

5-1 I recommend that another look be taken at the number of acres to be treated with herbicides on your forest land base on an annual basis. The Bureau cannot be an effective steward of the land it is to manage if it takes an ultra-conservative approach to the management of its timber resource.

The main body of the DEIS shows herbicides to be safe and efficent tools for forest management. Let's not be afraid to apply them to our public lands. The future wood supply of this country demands it.

Sincerely,

Chris Conrad

Chris Conrad
P.O. Box 216
Standard, CA 95373

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Response to Comment Letter 5

5-1 The BLM is a multiple-use agency and has attempted to balance the competing land uses through land use planning. The treatments discussed within the EIS are felt to be a reasonable approach to the many land use demands on the public lands.

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California State Director
Bureau of Land Management (932)
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

Dear Sir:

I am submitting comments regarding the California Vegetation Management DEIS. I am concerned about several areas, particularly those dealing with the use of herbicides on public lands.

I find little explanation of the need for the proposed vegetation management program. The DEIS states "Land use plans have been completed for the EIS through the BLM planning process ..." and "To meet the sustained yield production levels called for by these management decisions it may be necessary to control vegetation in some cases." (There seems to be very little "may be" about it.) The Proposed Action Alternative appears to be a predictable outcome of these management decisions coupled with existing economic constraints. The DEIS is thus little more than a
6-1 justification of what BLM Management has mandated by their land use decisions.

The DEIS states "The major change which effects treatments proposed in this EIS is that lands acquired as a result of exchanges are largely inadequately stocked and have heavy brush and hardwood stocking levels....Without intensive management the allowable cut would have to be reduced by an estimated 25 percent." Given the policy of acquiuring non productive timber land in exchanges and the desire to not reduce the cut, there seems little alternative but to recommend the proposed action. One must conclude that the DEIS is an expensive and elaborate justification of the use of herbicides to accomplish a management objective which they knew would be difficult or impossible without the use of herbicides.

Under Social Environment the DEIS states. "They <people> fear that approved herbicides may eventually be found to be as dangerous as other substances previously thought to be harmless." History has taught us little else. I remember vividly from my childhood the assurances that DDT was harmful to nothing more than insects. Asbestos was Gods gift to mankind. Dow Chemical assured everyone that Agent Orange was safe. The list is almost endless. The abundance of historical naivety coupled with uncertanties and outright disagreement within the present scientific community creates substantial doubt. As medical technology advances we learn more and more of the subtle and often long term effects the chemicals we are exposed to can have. We learn of intricate relationships between chemicals, cancer, our immune systems, our moods and psychological stability. Sometimes laboratory animals cannot provide the answers. We are dealing with known and/or suspected carcinogens (Amitrole is listed as a carcinogen by the California State Drinking Water and Toxics Enforcement Act) and mutagens. Extreme care is called for.

According to Dr. William Marcus, Chief Toxicologist at the EPA's Office of Water,"There is a growing body of evidence linking many toxic chemicals with a weakening of the immune system. If this is the case, then the notion that a given chemical causes a specific disease may be invalid in many instances. Toxic substances may simply predispose us, through the weakening of the immune system, to contracting a wide variety of illnesses."

Proposed Action Alternative 1 calls for aerial application of 2,4 D to 3500 acres (that's 5.6 square miles) each year. Shades of Vietnam. A Veteran's Administration study of Vietnam veterans who served as ground troops shows they are experincing a 58% increase in lung cancer and a 110% increase in non-Hodgkin's lymphoma over normal. Although it is popular to blame 2,4,5-T for those problems, 2,4-D, the other ingredient in Agent Orange is also suspected. 6-2 Only a year ago a well publicized study from the National Cancer Institute found a six-fold increase in non-Hodgkin's lymphoma among farmers exposed to 2,4-D. Need we repeat the mistakes of the past?

The most disturbing aspect of the DEIS is the lack of complete information on the 16 herbicides selected for use. Table H-1 showing the identified data gaps tells the story well. Picloram has data gaps in 20 out of 23 catagories. Simazine shows gaps in 18 of 23 catagories. Complete information on data gaps was not available for 8 of the 16 proposed herbicides. Four are not even listed on the chart. Etcetera. 6-3 But in spite of all the uncertainties and data gaps the DEIS purports to show herbicide use to be safe even under the worst case risk analysis. It is difficult to believe that a valid worst case analysis can be made with that much missing data. In those cases, we are told,a series of conservative assumptions or factors were used that tended to exaggerate the results." Statements such as, "Synergistic effects are not likely to occur since synergism rarely occurs with chemical mixtures" are not a good example of a conservative assumption. Numerous such

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statements may be found in the DEIS.

I read that "The overall cost of conducting the studies to fill the data gaps is considered exorbitant with respect to the limited funds available to the BLM. In addition the time required to perform and evaluate these tests is more than 2 years and would seriously delay the implementation of the vegetation management program." Are we in such a hurry that a delay of over two years is considered serious? Perhaps if substantially fewer herbicides were proposed for use, the cost would not be exorbitant.

6-4 Even though some of the DEIS analyses show that workers may receive doses exceeding their systemic NOEL, this is concluded to be acceptable because of the low probability of the worst case scenerio occuring. In my opinion this is an unacceptable conclusion. What will your position be 20 years from now if studies show BLM workers are dying of higher than normal cancer rates?

6-5 Another area which I feel was inadequately addressed is the possibility of contamination of groundwater supplies. The DEIS states "the potential exists for detectable traces to enter the groundwater." It shrugs this off with, "no significant impacts are expected." And yet we read almost daily accounts of groundwater which has been found to be contaminated with toxic chemicals.

6-6 In another source I read, "A recurring pattern of pneumonia and other bronchial disorders following broad-cast burning of herbicide treated brush has been documented in several valley communities in Oregon." Is your proposed delay of "several months to one year after spraying" adequate to prevent this? Your calculations show only that the quantities of herbicide being carried into the air will probably result in doses below the systemic NOEL.

6-7 While some discussion of synergistic effects of two or more herbicides is undertaken and dismissed, there is no mention of the possibility of synergistic effects with other chemicals with which we are routinely in contact.

In summary, I find little reason to accept the conclusion that herbicides may be applied to BLM land with negligible risk to public, workers, wildlife, or the environment. It is indeed true that "there is a growing sense that the nonprofessional public has a legitimate interest in how these resources are managed." While we may have little to say about what happens on private land, public lands are another matter and our input must be considered.

102

Cumulatively we own the land and have a right to be heard. I strongly urge you to adopt an alternative which manages BLM land without the use of herbicides.

Sincerely yours,

Eric Swanson

Eric Swanson
Member, Jackson Valley
Watershed Coalition

cc Donald Hodel
Senator Alan Cranston
Senator Pete Wilson
Congressman Doug Bosco

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Response to Comment Letter 6

6-1 The EIS has examined more closely what the impacts of vegetation control might be. This is part of a tiering process of environmental assessment. The land use plan EISs address land use allocations and resulting impacts. This programmatic EIS more specifically addresses the impacts of implementing the vegetation control aspects within land use plans while site-specific EAs will be done on each project proposed for on-the-ground treatment.

6-2 That study as well as a study reviewing the findings referred to is discussed on page H-A-7.

6-3 The discussion of data gaps follows the guidance related to NEPA procedures for such a situation, 40 CFR 1502. The EIS also shows that there may be risks from herbicide use and does not specifically state that herbicide use would be safe.

6-4 Only in one case is a systemic NOEL exceeded in a realistic scenario, and that is without protective clothing (Table C-9, page H-C-10). However with protective clothing the NOEL is not exceeded (page H-C-26). It is also true that in a few worst-case situations NOELs could be exceeded and these are acknowledged on page 3-35. It is expected that by using proper techniques and by being aware of these more hazardous situations management and workers can avoid the more risky situations.

6-5 It is unlikely that ground water impacts will occur where small amounts of herbicides are used usually only once in a period of many years. In addition "detectable" does not imply an impact.

6-6 A discussion on this issue has been added on page 3-27.

6-7 It is acknowledged on page H-121 that other chemicals exist in the environment.

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Suite 205
407 Jackson Street, S.F. 94109
January 17, 1988

For: Ed Hastey, California State Director
Bureau of Land Management (BLM) 932
%Mark Blakeslee
2800 Cottage Way
Sacramento, Ca 95825

Re: DEIS California Vegetation Management by BLM.
SLIDING TOWARD EXTINCTION. (Summary report for California Senate.)

I. I regret finding this document deficient and lacking in essential information for decision makers and the public. Natural areas are put at risk - the slide toward extinction inherent in the plan.

7-1 A. There is no description of the importance of the California flora, its ecosystems and geologic associations - all important for science, for the protection of watersheds and water quality.

If it had been adequately described, it would be given equal protection in your vegetation management program as required under multiple use - a BLM required Congressional mandate.

7-2 Under the list of 'preparers' on Page 4-3, there are no field botanists, plant ecologists or horticulturists listed. Your program essentially attempts to properly manage plants and you have no such experts on your staff. A forester is not an expert on plants per se, he may be an expert on how to market timber and how to exploit forests for maximum output.

II. On Page A-3 note the issue not addressed,

7-3 "Should evaluate or eliminate the management actions leading to the need for vegetation control."

Now that is where the DEIS should have been centered. That is the most lacking information of all.

There may be no need to destroy some 35,800 acres of vegetation by aerial herbicide and burning regimes - IF a better forestry/grazing management program were selected. It is clear cutting and overgrazing that leads to weedy species invasion.

Although some burning AT THE RIGHT TIME OF YEAR may be desirable in some areas, the recent forest fires in California REQUIRE a new forestry system. It is your selected forestry practise - plantation, even age forestry - which proved the worst practise. These areas burned hotter, destroyed more, ruined soils faster and damaged watersheds to a greater degree than other forested areas.

III. Sliding Toward Extinction in California. How will BLM halt it on the public lands they manage?

Enclosed is the Executive Summary of this report prepared at the request of the California Senate by Jones & Stokes. The summary and full report are available from The Nature Conservancy.

1-4 It received wide and continuing publicity. Please obtain this report. Please respond to it in this plan and your land management activities.

continued ...

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A. Under multiple use and land management/stewardship needs, BLM must have experienced, adequately trained personnel. In your field offices BLM has sometimes had no field botanists or plant ecologists who are trained to recognize rare plants and unusual ecosystems.

You have 18 million acres - how many on your staff can do field work required for rare and endangered plant species and in identifying new or rare ecosystems?

If land management decisions are preceded by a call to the Sacramento Data Base to fulfill your rare plant protection program then you deceive yourselves and fail the public.

Your vegetation management should not say you have a species protection program when you lack the resources/personnel to do this.

B. Native species are often the target of vegetation mangement when they might be vital where clear cutting is practised. Ceanothus, lupine and mountain misery are ecologically important if not essential for sucession or maintenace of the forest. It is a slower process than the forestry quick fix of intensive chemical/mechanical type planting of monoculture species like pine or fir.

7-5 C. Your policies of vegetation management are terribly destructive of diversity in our public lands when they are carried out for clear cutting and overgrazing.

In conclusion I would like to urge a radical change from BLM's alternative. I would urge maximum clearcuts of 5 to 15 acres with minimum use of heavy equipment. All grazing should be eliminated from public lands where beef and milk are in over production requiring federal subsidies. It makes no sense to destroy natural areas when we don't need the production. BLM can recommend that to Congress; BLM can halt all of its own subsidies for grazing. If ranchers paid their fair share of the costs, they wouldn't graze public lands.

If selective logging were used in the main, little herbicide use would be needed - that could be manually applied. Tamarisk removal is very desirable - it is a known weed damaging ecosystems.

In order to make good use of our public lands for the long term and for future generations (which is the purpose of the EIS - National Environmental Policy Act -), natural diversity protection MUST be the first and highest priority.

I urge you to prepare a document worthy of federal goals.

Susan M. Smith

Susan M. Smith

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Response to Comment Letter 7

7-1 California flora has been given extensive consideration, as referenced by BLM's sensitive species policy, page 1-5, and the extensive list of plants of concern in Appendix J.

7-2 The position titles used by BLM do not necessarily reflect the individual's expertise. A Range Conservationist often has botanical and plant ecology background and duties. In addition the preparers listed are backed by other BLM employees such as our State Office Botanist. Other experts were also consulted and provided input at various stages.

7-3 See response 3-1.

7-4 We are aware of this publication, however nothing of direct use for this effort is contained in the report.

7-5 Diversity is addressed on page 3-12.

BEST

8

United States Department of the Interior

BUREAU OF RECLAMATION
LOWER COLORADO REGIONAL OFFICE
P.O. BOX 427
BOULDER CITY, NEVADA 89005

IN REPLY
REFER TO: LC-153A

JAN 13 1988

Memorandum

To: California State Director, Bureau of Land Management,
2800 Cottage Way, Sacramento, California 95825
Attention: Mr. Mark Blakeslee

From: ACTING Regional Director

Subject: Review of Draft Environmental Impact Statement for California Vegetation Management (DES 87/36) (memorandum from the Commissioner dated December 16, 1987)

We have reviewed the subject document and find no impacts on Bureau of Reclamation activities. The document appears well written and appropriate for the purpose intended.

Dennis D Wolfe

cc: Commissioner, Washington, D.C.
Attention: 150

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9

CITIZENS FOR MOJAVE NATIONAL PARK

P. O. BOX 106 BARSTOW, CA. 92311

California State Director
Bureau of Land Mangement (932)
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

Dear Mr Blakeslee; 1/19/88

Thank you for sending us a copy of your draft December 1987 California Vegetation Management EIS.

It is shocking to see that BLM has sunk to a new low in this draft EIS In the CDCA (California Desert Conservation Area) there is no vegetation management that needs to be done except tamarisk removal, and that doesn't require an EIS

In the 15 years I have worked with BLM in the CDCA (except for tamarisk removal), I have seen no BLM expertise on vegetation First of all, there should be no grazing allowed on public lands This welfare grazing on public lands must be eliminated as soon as possible Cattle and sheep muck up the vegetation and taxpayers will soon end the welfare subsidies There is absolutely no need for vegetation management on BLM lands for livestock grazing as this must be eliminated as soon as possible

It appears from this EIS that the chemical companies are trying to rape BLM just as they have done on US Forest Service lands We are absolutely opposed to the use of herbicides and pesticides in the CDCA and I can see no reason for their use on any other California public lands The risk of cancer (page 3-36) is enough to prohibit their use

Many people look to BLM as a welfare agency and this is wrong Grazers and chemical companies should have nothing to do with BLM lands

This EIS is useless and should be redone or junked There was nothing specific on any area in California and that alone makes it worthless

We are utterly opposed to any vegetation management in EMNSA (East Mojave National Scenic Area), and can see no reason for any vegetation management at all (except tamarisk removal by hand) in the CDCA

Because BLM is such an irresponsible agency we can see no need for vegetation management anywhere until BLM gets its priorities straight and starts protecting natural and cultural resources and eliminates welfare grazing on public land

Sincerely,
Peter Burk
Peter Burk, President

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10

c/o Calif. Coalition for
Alternatives to Pesticides

Jan. 21, 1988
Redding, CA.

To Whom it may Concern:

This letter is written to express my concern about, and absolute opposition to, the proposed use of chemical herbicides and pesticides on BLM (or other federal or state government) land as proposed by the Calif State Office of BLM, in Dec. of 1987, + as reported to me by newspaper this date.

I am a wife and mother who is trying to minimize, not increase, the toxic substands my child will be exposed to. My husband had a good friend die unnaturally of a brain tumor after being exposed to "Agent-Orange". As a government agency, BLM is under the obligation to "government of, by + for the people". Any money saved by this false economy of chemical use will be spent many times over in social ills excaberated by the unwise and poisonous use of such already suspect, toxic eroders of human health. This is not government for benefit of the people, and as a taxpayer and United States citizen I am entitled to express this opinion and to expect better priorities from government agencies, especially one commited to maintaining for *public-use*, lands entrusted to their *care*. If "public" means people, and "caring" means a real concern for well-being, BLM would be betraying their principles to promote a program that is so blatantly against the well-being of the people that these lands are held in care *for*.

As one of these people, I hearbye express the opinion that: ① this program is a bad-idea, and ② a vote of "NO" be registered against it. As I said no economic savings from such toxic additions to our food + water can justify the costs to society, in health + suffering, that they will cause.

Yours Very Truly,
(Mrs.) Irene M. Koch-Marcus

2723 Kenco Ave.
Redding, CA. 96002

4-19

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11

Counties of Inyo-Mono

DONALD R. MUSE
AGRICULTURAL COMMISSIONER
DIRECTOR OF WEIGHTS AND MEASURES

[illegible] W. SOUTH ST. • BISHOP, CA [illegible] • TELEPHONE [illegible]

January 21, 1988

TO: California State Director
Bureau of Land Management

FROM: George L. Milovich, Deputy Director
Inyo/Mono Counties, Department of Agriculture

SUBJECT: Draft E.I.S. for California Vegetation Management Plan

Our office has reviewed the Bureau of Land Management's proposed Vegetation Management Plan for California, and found that Alternative 1, The Proposed Action, best suits the needs of agriculture in Inyo and Mono Counties.

The proposed action parallels State Food and Agriculture requirements that alternate vegetation control always be investigated prior to any use of pesticides. However, it allows for pesticide use when the need arises.

This is essential in stopping a noxious weed infestation before it becomes a serious threat to agriculture.

GLM/rlc

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12

P.O. Box 726
Redway, CA. 95560
Jan. 27, 1988

Calif. State Director BLM
c/o Mark Blakeskee
2800 Cottage Way
Sacramento, CA. 95825

Dear Mr. Blakeskee,

I am writing to say I am opposed to any renewal of spraying herbicides of public lands.

I live close to BLM land and feel spraying is unhealthy for the land, air, and water.

These sprays kill plants, they are poisen. These sprays don't go away they end up in our enviornment.

2

I feel we must stop poisening ourselves and our planet.

We must realize the far reaching consequences of our actions.

Sincerely,

Judy Lee Ramsey

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13

Derham Giuliani
170 Flower Alley
Big Pine, CA 93513

18 January 1988

Bureau of Land Management

Dear Sirs:

I have reviewed the DEIS for the California Vegetation Management program. My concerns pertain to the impacts on wildlife.

I found that the Wildlife Risk Assessment (Appendix L) was totally inadequate to tell me what the effects of the herbicides might be.

Page L-1 states "The toxicity of herbicides to wildlife varies among individuals of the same species (intraspecific), between different species (interspecific), and, often most markedly, between different classes of animals". My own work with animals has placed me in full agreement with that statement. But the next forty-plus pages replaced this fact with fantasy, the worst being extrapolation from partridge to snake, rabbit to fox, rat to deer, quail to screech owl, chicken to toad, etc, etc. (among the most ridiculous things I have ever read). 13-1

13-2 Many other unresolved questions arose, such as: Why wasn't the LD_{50} figure of 2000 for the Gray-tailed vole for simazine (Pg L-36) used for the representative "mouse" instead of the 5000 figure for the laboratory mouse? 13-3 I could not find anywhere in the document any of the references mentioned on pages L-21 and L-22. In the Aquatic Risk Analysis: NO DATA was listed for insects and amphibians in over 65% of the herbicides listed for a truck spill into a pond; NO DATA for amphibians in 80% of the herbicides to be used in aerial spraying; etc.

13-4 To my mind, Appendix L does not at all demonstrate the validity of the conclusions given, such as: "No direct toxic effects are expected from the use of any of the herbicides proposed for use" (Page 3-16), "As shown in Appendix L there are no likely toxic effects to wildlife from herbicide use" (Page 3-20), "No significant toxic effects on wildlife from chemicals" (Page iii and 1-13).

Accordingly, No Use of Herbicides is the only Alternative I can accept.

Sincerely,

Derham Giuliani

Response to Comment Letter 13

13-1 Yes, it is difficult, however, if some basis for extrapolation exists when data is lacking, conservative assumptions are made.

13-2 A laboratory mouse is a mouse while a vole does not have the same biology as a mouse, see your comment regarding extrapolation.

13-3 The missing references have been included in the list of edits following these comments.

13-4 Statements on pages iii, 1-13, and 3-20 have been reworded, and are now found on iv, 1-13 and 3-22.

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14

Department of Water and Power the City of Los Angeles

TOM BRADLEY
Mayor

Commission
RICK J. CARUSO, *President*
JACK W. LEENEY, *Vice President*
ANGEL M. ECHEVARRIA
CAROL WHEELER
WALTER A. ZELMAN
JUDITH K. DAVISON, *Secretary*

PAUL H. LANE, *General Manager and Chief Engineer*
NORMAN E. NICHOLS, *Assistant General Manager - Power*
DUANE L. GEORGESON, *Assistant General Manager - Water*
DANIEL W. WATERS, *Assistant General Manager - External Affairs*
NORMAN J. POWERS, *Chief Financial Officer*

February 1, 1988

Mr. Ed Hastey
California State Director
Bureau of Land Management (932)
2800 Cottage Way
Sacramento, California 95825

Attention Mr. Mark Blakeslee

Dear Mr. Hastey:

California Vegetation Management
Environmental Impact Statement

The Department's Range and Wildlife staff has reviewed the Draft Environmental Impact Statement for the California Vegetation Management program.

Our staff finds that "Alternative 1: The Proposed Action" is clearly defined and appears to be adequate for controlling and managing vegetation. We would like to be notified of any vegetation management activities that will be occurring on land adjacent to Department property in Inyo and Mono Counties.

Thank you for the opportunity to comment.

Sincerely,

Duane D. Buchholz

DUANE D. BUCHHOLZ
Northern District Engineer
Los Angeles Aqueduct Division

cc: J. Morrison

111 North Hope Street, Los Angeles, California [] *Mailing address:* Box 111, Los Angeles 90051
Telephone: (213) 481-4211 *Cable address:* DEWAPOLA

15

DEPARTMENT OF
PLANNING AND DEVELOPMENT SERVICES

RANDALL L. ABBOTT
DIRECTOR
STEVEN G. LADD
Assistant Director

Mailing: 1415 Truxtun Avenue
Bakersfield, CA 93301
Location: 1356 Norris Road
Bakersfield, CA 93308

(805) 861-2615

February 1, 1988

FILE: Agency
BLM

California State Director
Bureau of Land Management (932)
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

Re: EIS - California Vegetation Management

Ladies and Gentlemen:

Thank you for the opportunity to review the above noted project. It adequately reflects the concerns of this Department. We have no further comments at this time.

4-22

Very truly yours,

RANDALL L. ABBOTT, Director
Planning and Development Services

Frank Chmiel
by Frank Chmiel
Junior Planner

FC:cms

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16

Feb. 1, 1988

State Director BLM
2800 Cottage Way
Sacramento CA, 95825

Dear State Director,

I would like to comment on the BLM's plan to spray herbicides on forestland in the King Range and in the Arcata Resource Area.

Many of the proposed chemicals are mutogenic and/or carcinogenic. Other proposed chemicals have not been fully tested for health and safety risks. This shows a criminal negligence on the part of the BLM. These chemicals are going to leach into drinking water supplies and will pass into the fish and wildlife and people of the Northcoast. These harmful side effects need to be figured into your decisions, rather than basing them only on economics.

Instead of only considering the use of deadly sprays, the BLM should pursue manual site preperation and conifer release. Not only is this method more ecologically sound, but it is better forestry. People on the ground are able to make better decisions for the forest than broad spectrum, non-specific herbicides sprayed from the air. Microclimate based, site-by-site decisions create a healther forest, and provide jobs as well.

Please consider a manual release alternative, and do not spray our Northcoast forestlands.

Sincerely,
Kurt Newman

17

MaryAnn Czermak
Certified Graphologist
6814 Belmont Drive
Palo Cedro, Ca., 96073
February 5, 1988

California State Director
Bureau of Land Management (932)
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, Ca., 95825

Gentlemen,

Thank you very much for sending the Environmental Impact Statement Draft. After studying it carefully I have to say that it is wordy and inconclusive and, as our ecologically shaky present proves, most of the so-called tests that have been performed are worthless.

I find it questionable if the clearing of all that land is really necessary If some of it were left in its natural state it would undoubtedly be better for the soil and more pleasing for the eye. It is shortsighted to cite effects on only a small segment of the population. Concern has to be for **EVERYBODY**.

A simple decision to ban the use of all pesticides would have made tests as well as the printing of this heavy volume unnecessary and, therefore, saved the Government and the taxpayer much money. Prisoners, parolees and welfare recipients could make up the workforce and it would give the latter an excellent opportunity to do something for their country after years of only taking. Perhaps it would even instill in them a sense of pride and accomplishment.

I can do no better than to urge you strongly again to forego the use of **ANY** pesticides and clear some of the land either mechanically or manually. May I also suggest that a good grade of trees is used for replanting instead of something that only grows fast.

Thank you for the opportunity to express an opinion.

Sincerely,

cc: Senators Cranston, Wilson
Assemblyman Statham
Congressman Herger

RECEIVED
BUR. OF LAND MGMT
FEB 8 1 22 PM '88
SACRAMENTO, CALIFORNIA

18

CALIFORNIA ASSOCIATION OF 4WD CLUBS INC.

1730 "I" Street, Suite 240
Sacramento, CA 95814
(916) 446-4562

February 4, 1988

Bureau of Land Management
Mr. Ed Hastey, State Director
2800 Cottage Way
Sacramento, CA 95825

SUBJECT; California Vegetation Management Plan, DEIS, Dec. 1987

Dear Mr. Hastey

CM1

This organization has reviewed the subject plan and concurs with the proposed alternative for controlling vegetation. We are not concerned with the use of herbicides on public lands as long as they are applied as prescribed under the proposed alternative.

Sincerely,

Ed Dunkley,
Field Representative

ED:jd

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111

19

Southern California Edison Company

P O BOX 410
100 LONG BEACH BOULEVARD
LONG BEACH CALIFORNIA 90801

REAL PROPERTIES DEPARTMENT

TELEPHON
(213) 491 28

February 1, 1988

California State Director
Bureau of Land Management (932)
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

Gentlemen:

SUBJECT: Draft Environmental Impact Statement for the California Vegetation Management Program.

The Southern California Edison Company has reviewed the subject document and offer the specific comments as follows:

o Indirect Impacts to Edison - We anticipate no direct impact to Edison as a result of any of the proposed alternatives. Indirect impacts to Edison may result, however, if all aspects of the proposed action are not carefully considered and fully evaluated prior to implementation. For example, vegetation management applied in an area providing habitat for sensitive plant or animal species could adversely effect these species, degrading their already tenuous status. This could adversely effect Edison's current and proposed operations in areas where habitat for these species exist by making future licensing more difficult or altering our current management activities.

The proposed vegetation management practices would not have to be a direct impact to sensitive species for adverse impact to occur. For example, eliminating vegetation in a particular area may adversely effect insects upon which an endangered species is dependent. Removing the food source for this endangered species would adversely effect it's population if alternative prey sources were not available. This actually happened with the flat-tailed horned lizard (Phrynosoma mcalli), where insecticides were aerially sprayed over a large area of the East Mesa (Imperial County). This application resulted in killing most of the ants in the region. Since the flat-tailed horned lizard feeds almost exclusively on ants, its primary food source was lost, resulting in a drastic population decline for this species. As a result, this species has become scarce. Due to its scarcity, it is considered sensitive and has become a major constraint to project licensing and operations.

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In addition to this concern, Edison is sometimes placed in the position of managing vegetation or selected target species (including endangered species) as a part of a mitigation program associated with a licensed project or activity. The BLM's proposed vegetation management practices may impinge on this activity.

19-1 This document does not provide specific enough information to determine which management technique (e.g., aerial application of herbicide, prescribed burning, etc.) the BLM intends to use where. We recommend that the BLM provide prior notice to any planned management, indicating the area to be treated, the treatment process, result of pretreatment surveys, etc., so that Edison may have the opportunity to comment. Our review of the proposed activity may help prevent adverse impacts to sensitive species that ultimately affect Edison and would prevent adverse impact to some of Edison's mitigation management programs.

19-2 o Sensitive Species - The BLM's list of sensitive species is not complete. For plants, at least two species known to occur on BLM lands in the Bakersfield District are not included on the list (Table 2-2 and Appendix J). These species are cotton buckwheat (Eriogonum gossypinum) and Bakersfields Cactus (Opuntia basilaris ssp. treleasei). We feel that there are other species that could be included on this list.

19-3 For sensitive animal species, there are numerous species not included on the list (Table 2-4). These species include: giant kangroo rat (Dipodomys ingens), federal listed endangered; Tipton kangroo rat (Dipodomys nitratoides ssp. nitratoides), proposed federal endangered; desert tortoise (Gopherus agassizi), (BLM Sensitive and proposed federal and state listing as endangered and threatened, respectively); golden eagle (Aquila chrsyaetos), BLM Sensitive; etc. The listing of animal species is incomplete and should be re-evaluated.

19-4 In addition to the above, the same criteria for defining sensitive plant species are not used in defining a sensitive animal species. When Edison applies for project licensing on Public Lands, we are required to consider U.S. Fish and Wildlife Service candidate species and/or species considered sensitive by other organizations. Shouldn't the BLM also apply the same standards to their proposed activities?

19-5 o List of Noxious Weeds - The list of noxious weeds on Public Lands subject to proposed management activities is questionable. For example, why is the Russian thistle (Salsola iberica) not listed? This species is a major problem for the Coachella Valley fringe-toe lizard (Uma inornata), causing stabilization of aeolian sand deposits upon which the lizard is dependent. Tamarisk (Tamarix ssp.) should also be on the list. This species has invaded stream courses and other water sources in the desert, causing the displacement of native vegetation that endemic wildlife species depend on.

In addition to those species not on the list, there are some 4-6 where information concerning the species is inaccurate. For example, according to Munz (the accepted atuthority on California vegetation), white horsenettle (Solanum elaeagnifolium) is found as a widely introduced weed throughout southern California and the Central Valley, and is not just limited to the desert of southern California. The content and accuracy of this list could be re-evaluated.

14-7 o Pretreatment Surveys - The BLM indicates that it proposes to perform pretreatment surveys for cultural resources and sensitive species. Considering their limited personnel and funding, we find it difficult to believe that the BLM can adequately survey these areas (up to 35,000 acres) in a manner capable of preventing impact to sensitive resources. Our concern provides additional justification for the BLM to publicly notice proposed treatments so that the public may provide data or information on the presence of sensitive resources.

Thank you for the opportunity of reviewing this draft and we would appreciate receiving a copy of the final document.

If you have any further questions, please call D. L. Myles at (213) 491-2880.

Very truly yours

D. L. Miller
Supervisor of
Project Licensing & Planning

7317PLP/hrg

Response to Comment Letter 19

19-1 This will be the function of site-specific EAs which will be done on each project, see page 1-15.

19-2. Different agencies have differing definitions and lists. We are using the BLM approach. In regard to cotton buckwheat it is now a U.S. Fish and Wildlife Service (FWS) Category 3 plant and receives no special consideration and while Bakersfield cactus is listed by FWS it is not found on BLM-managed public land.

19-3 Table 2-4 has been updated, however, the golden eagle is not a BLM sensitive species.

19-4 BLM does use different definitions for sensitive plants and animals. BLM does consider candidate species whether or not they are BLM sensitive species.

19-5 Russian thistle is on the noxious weed list, see page B-5. Tamarisk is not an identified noxious species, it is however considered an undesirable plant in some situations and is proposed for treatment.

19-6 The list does not intend to list all species of concern, instead it lists plants known or suspected to occur on BLM-managed lands.

19-7 BLM has no choice and has to conduct these surveys. Other workloads may be deferred in order for the surveys to be done. In addition recent staffing additions have been made to help address these needs.

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20

State of California
GOVERNOR'S OFFICE
OFFICE OF PLANNING AND RESEARCH
1400 TENTH STREET
SACRAMENTO 95814
916/323-7480

EORGE DEUKMEJIAN
GOVERNOR

DATE: February 8, 1988

TO: Mr. Mark Blakeslee
Bureau of Land Management
2800 Cottage Way
Sacramento, CA 95825

FROM: **Office of Planning and Research**
State Clearinghouse

RE: SCH 86031717---Draft EIS, California Vegetation Management, Statewide

As the designated California Single Point of Contact, pursuant to Executive Order 12372, the Office of Planning and Research transmits attached comments as the State Process Recommendation.

This recommendation is a consensus; no opposing comments have been received. Initiation of the "accommodate or explain" response by your agency is, therefore, in effect.

Sincerely,

Huston T. Carlyle, Jr.
Director, Office of Planning and Research

Attachment

cc: Applicant

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Resources Building
1416 Ninth Street
95814
(916) 445-5656
TDD (916) 324-0804

California Conservation Corps
Department of Boating and Waterways
Department of Conservation
Department of Fish and Game
Department of Forestry
Department of Parks and Recreation
Department of Water Resources

GEORGE DEUKMEJIAN
GOVERNOR OF
CALIFORNIA

THE RESOURCES AGENCY OF CALIFORNIA
SACRAMENTO, CALIFORNIA

Air Resources Board
California Coastal Commission
California Tahoe Conservancy
California Waste Management Board
Colorado River Board
Energy Resources Conservation and Development Commission
San Francisco Bay Conservation and Development Commission
State Coastal Conservancy
State Lands Division
State Reclamation Board
State Water Resources Control Board
Regional Water Quality Control Boards

Mr. Mark Blakeslee
Bureau of Land Management
2800 Cottage Way
Sacramento, CA 95825

February 8, 1988

Dear Mr. Blakeslee:

The State has reviewed the Draft Environmental Impact Statement, California Vegetation Management, submitted through the Office of Planning and Research.

Review was coordinated with the Air Resources Board, Coastal Commission, San Francisco Bay Commission, State Lands Commission, and the Departments of Conservation, Fish and Game, Food and Agriculture, Forestry and Fire Protection, Health Services, Parks and Recreation, and Transportation.

The Departments of Fish and Game, Forestry and Fire Protection, and Parks and Recreation have prepared the attached comments for your consideration.

Thank you for providing an opportunity to review this document.

Sincerely,

Nadell O Gayou
For Gordon F. Snow, Ph.D
Assistant Secretary for Resources

Attachments (3)

cc: Office of Planning and Research
1400 Tenth Street
Sacramento, CA 95814

(SCH 86031717)

BLE

State of California **The Resources Agency**

Memorandum

To : Gordon F. Snow, Ph.D.
Projects Coordinator
Resources Agency

Date : February 8, 1988

From : **Department of Fish and Game**

Subject : California Vegetation Management (Bureau of Land Management)
Draft Environmental Impact Statement (DEIS), SCH 86031717

The Department of Fish and Game (Department) has reviewed the subject document. The proposed project could affect approximately 35,000 acres of publicly-owned fish and wildlife habitat per year. We offer the following comments.

The Department is highly supportive of the Bureau of Land Management's (BLM) plans for the removal of the introduced exotic tamarisk. However, we recommend a more intensive program than 150 acres per year. The Department also supports the prescribed burning program in chaparral for its benefits in wildfire fuel reduction and wildlife habitat improvement.

4-27

20-1

The plan proposes a variety of treatment methods that would convert sagebrush scrub/juniper range to a grass range at the rate of 11,000 acres per year, and could be detrimental to wildlife. Unlike prescribed burns in chaparral where many benefits occur, sage/juniper conversion to grass results in a very limited benefit. Such projects can have very significant detrimental effects on sage grouse, antelope, and deer. These game species as well as many nongame species depend on the sagebrush/juniper vegetation for food and thermal cover. A conversion program which results in small grassland communities within the sage scrub/juniper community type could be acceptable. We recommend that BLM seek comments from the Department's field biologists when designing any sagebrush scrub/juniper conversions.

We concur with the Department of Parks and Recreation's comments regarding the document's inadequate treatment of State-listed animal species and candidate/sensitive species. The DEIS should discuss the impact of vegetation management on these species, and should provide detailed policies for management of these species.

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Thank you for the opportunity to comment on the DEIS. If you have any questions, please contact Mr. Scott Clemons, Environmental Services Division, (916) 322-5655.

Robert C Fletcher
For Pete Bontadelli
Director

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State of California The Resources Agen

Memorandum

To : Gordon F. Snow, Ph.D.
Assistant Secretary for Resources
Resources Agency
1416 Ninth Street, 13th Floor
Sacramento, CA 95814

Date : February 8, 1988
R9
Telephone: ATSS ( )
( )

From Department of Forestry & Fire Protection

Subject 0900 ENVIRONMENTAL PROTECTION
Draft Environmental Impact Statement
#86031717 California Vegetation Management

The Department of Forestry and Fire Protection has the following comments on the Draft Environmental Impact Statement (EIS) on Vegetation Management submitted by the Bureau of Land Management.

20-2 1. The reference section (R-1 through R-16) could be improved by providing a complete bibliography of all documents referred to in the text. One could then obtain, for example, one of the many EIS's on livestock grazing for an area to help them understand this "umbrella" EIS.

20-3 2. The Department concurs with the information on herbicides described in the EIS. The expertise at BLM is probably not, nor should be, qualified to evaluate the actual hazards of herbicide use. Rather, BLM should closely follow approved label instructions on herbicides when used. As with any decision, BLM personnel must be certain to apply the best treatment to each situation, based on considerations of all available alternatives.

Jay D. Wickizer
Jay D. Wickizer
Environmental Coordinator

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State of California The Resources Agency of California

Memorandum

Date : February 1, 1988

To : Gordon F. Snow, Ph.D.
Project Coordinator
Resources Agency

From : Department of Parks and Recreation

Subject: California Vegetation Management (Bureau of Land Management)
Draft Environmental Impact Statement
SCH# 86031717

The Department of Parks and Recreation has reviewed the subject document. The proposed project could affect properties within the State Park System throughout the State.

20-4 In general, the EIS needs a better discussion of restricted materials/restricted use classifications, and how this would affect use. Tebuthiuron should not be used because of problems with high leachability and persistence. Aerial spraying efforts should be reviewed and approved on a case by case basis. Recent data suggest Triclopyr--rather than Picloram--is the recommended material for tamarisk.

Our specific comments correspond to statements in the EIS on the pages indicated below:

20-5 2-14 The hardwoods that are to be harvested from forest zones are of critical importance to a variety of sensitive wildlife species (e.g.: alder habitat for ruffed grouse in Humboldt County). Hardwoods should be conserved, especially in key wildlife areas.

20-6 2-17 The EIS should also consider State listed animal species, State candidate species, and sensitive species identified by the California Department of Fish and Game. The vegetation management plan should provide detailed policies for handling these species (as it did for rare plants).

20-7 2-18 Table 2-4 is outdated (e.g.: Least Bell's vireo is now listed as Federal-endangered; Swainson's hawk is State-threatened). The EIS should mention the legal protection afforded candidate species and critical habitats.

20-8 3-15 Add to this section: Juniper woodland is habitat for Swainson's hawk, a State-threatened species, and should be managed accordingly.

20-9 3-16,17 We disagree that conversion of big sagebrush to grass will produce only mixed impacts on wildlife. If winter range forage is reduced, then deer and antelope populations will decline (winter forage is presumably more critical than spring forage to overall population maintenance). Big sagebrush habitat should be conserved in sage grouse (a sensitive species) territories. Any large scale vegetation conversion is detrimental to populations of animals associated with the targeted vegetation. Plot sizes should be small in order to lessen the impacts and to conserve populations of animals.

Tamarisk removal should be a higher priority, with an increase in treated plot acreage.

20-10 Using translocated herbicides for brown and burn will cause a species change by reducing the percentage of sprouting species. This is not merely a seral change, but is a major community change.

Please keep us apprised of the progress of the project. Our contact is Mr. James M. Doyle, Supervisor, Environmental Review Section, P.O. Box 942896, Sacramento, CA 94296-0001, telephone (916) 324-6421.

Richard G. Rayburn, Chief
Resource Protection Division

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Response to Comment Letter 20

20-1 These impacts are identified on page 3-19. See response 20-9.

20-2 We have included a list of BLM grazing EISs and planning documents in the Final EIS.

20-3 It is noted on page 1-7 that herbicide label information will be followed. In addition before any herbicide is used a Material Data and Health Data Sheet will be obtained from the manufacturer.

20-4 Normally under state law noncertified applicators can apply non-restricted herbicides, however BLM requires that certified applicators be used for all herbicide applications not just restricted chemicals. This requirement also applies to individuals working under BLM contract.

Tebuthiuron is persistent but is only moderately mobile in soil (page F-15). These factors will be considered on a site-specific basis to determine if it would be used or not. All herbicide use not just aerial spraying will be evaluated on a project-by-project basis (page 1-5). We are aware that triclopyr is appropriate for use on tamarisk.

20-5 The ruffed grouse is not a sensitive species. The adverse impact to wildlife from removing hardwoods in forest management areas is identified on page 3-19.

20-6 See response 19-4.

20-7 Table 2-4 has been updated.

20-8 The Swainson's hawk has been added to Table 2-4 and will be given appropriate consideration.

20-9 The comment assumes large-scale conversion of sagebrush to grassland. The majority of sagebrush burns will be designed to increase the edge effect and leave a mosaic of unburned/burned vegetation. Sage grouse nesting complexes will be avoided through the site-specific project design. It is also questionable whether winter forage is more critical, in many areas succulent spring forage required by lactating does has a more significant effect on fawn survival and herd recruitment.

20-10 Many sprouting chaparral species also reproduce very successfully from seed, i.e., chamise and manzanita. It is unlikely that brown and burn treatments would significantly reduce these species. Other species such as toyon, scrub oak, and mountain mahogany are more likely to be affected. These species still have the capability to recolonize from adjacent areas by diaspores. Because of utilization of mosaic treatments and often incomplete kill from herbicides, it is unlikely major community changes will occur, except in certain areas, and this must be assessed on a case-by-case basis.

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21

February 8, 1988

California State Director
Bureau of Land Management
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

Regarding the recently proposed initiation of herbicide spraying for vegetation management of federally owned timber lands; are you, the educated professionals that you are, still so naive as to believe in the safety of these potentially hazardous chemicals, some of which contain Dioxin? Or does a simple dollar value influence you to the point of wanton disregard for human life?

I personally know of a couple whose spring was contaminated by the aerial spraying of forest land above the headwaters of their water supply. The months that followed this spraying began a nightmare for these innocent people. All of the animals born on their farm were either stillborn or born with such severe birth defects that they too soon died. Sadder yet, both husband and wife also became ill, the wife dying within two years of an unexplained lymphoma and the husband suffering from an unexplained skin rash for the next few years before he too died of cancer. No, this was not a double blind study into the effects of Dioxin poisoning, but a person has to be blind not to see the connection here.

If Dioxin is so safe, why was an entire town in Tennessee evacuated after it's dirt roads were sprayed with a Dioxin containing oil? And why is so much research still going on investigating the mutagenic properties of Agent Orange which contains Dioxin and was used widely during the war in Vietnam? And why is the EPA so concerned with the Dioxin containing effluence being released by the pulp mill industry?

Prudence should prevail as we await further studies of this insidiously dangerous substance and there should be no more use of Dioxin containing herbicides on public and private lands. There are alternatives to the use of herbicides. Manual release is effective and entirely realistic as a method of vegetation management. In addition to freeing the conifers, hardwood products can be produced and badly needed jobs provided for our communities. While there may be a few more dollars involved, this should not be a factor in choosing between poisoning the population at large or protecting them! Our tax dollars will be better spent this way than on many of the other choices now made by those who see profit before public safety.

Surely you and the others who make the decisions to spray these herbicides can see how in the past many chemicals which were deemed safe for use (DDT is a classic example) have eventually been proven to be lethal and that this is quite possibly the case with Dioxin. Why should we, the public, be forced to be at the mercy of these mistakes again?

Please see that the danger is real and reverse this recent decision to use Dioxin containing herbicides in vegetation management. How can you sleep at night knowing that your decision may afflict innocent people with countless health problems, tremendous suffering and early death from this poison?

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22

February 3, 1988

California State Director
Bureau of Land Management
(BLM)
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

Dear Director:

I am strongly opposed to the use of herbicides in the Bureau of Land Management's California vegetation management program. Of the 16 herbicides proposed for use, your agency itself admits that fully half are known or potential carcinogens. Furthermore, the California Department of Food and Agriculture has found that 10 of the herbicides have test data that indicates harmful effects such as gene mutations and birth defects.

22-1 In terms of the potential for a spray-related accident, I ask you to look at the record of the last federal agency to spray California forestlands—the U.S. Forest Service. During the last four years it sprayed in California, from 1980 to 1983, 14 accidents were reported (including a helicopter dumping 250 gallons of 2,4-D and another herbicide in the Los Padres National Forest and a plane crash in the Modoc National Forest which resulted in 150 gallons of two herbicides contaminating a stream). Problems were also reported with tank trucks leaking herbicides on roadways, helicopters spraying into watercourses, and worker accidents.

It has become very clear that using herbicides is a risky business, and when these herbicides are used on public lands, as the BLM proposes, the risk to the public is even greater. Please do not use herbicides as part of your California vegetation management program and protect the health and well-being of all Californians.

Thank You,

Scott Rappaport
P.O. Box 4584
Arcata, CA 95521

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Response to Comment Letter 22

22-1 An analysis of accidents is contained on pages H-103 to H-105 and contains a sample base including air and ground accidents and includes volume of the spills.

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23

Mr. Ed Hastey
California State Director
Bureau Land Management
2800 Cottage Way
Sacramento, CA 95825

Jan. 27.1988

Dear Ed:

The Draft EIS "California Vegetation Management" recently came to me for comment. There is one small criticism that I wish to record with you. This Draft EIS is important as one of a number of EISs on the management of BLM lands. For example, under Livestock and Wild Horses, page 2-17, mention is made of 18 site specific grazing EISs. References to others are made. All of these EISs contain valuable information that should be more widely known outside BLM. Of great help would be a list of the EISs that BLM has in California. The list of references, R-1
23-1 through R-16 is great. It would be even better with a listing of all the documents referred to in the text. This list would be most valuable if it were up-dated on a seperate page in each new EIS published.

My other comments apply to your over-all treatment of herbicide use in the management of rangelands. The analysis of the literature on the risk and hazard of the 16 herbicides is exhaustive and it is objective. The lack of or slight danger to the environment from them is fairly and objectively described. The use of these herbicides on rangeland is justified and should have no more restrictions than the use of herbicides on farm land. I congratulate you on this analysis and approach to herbicides and sincerely hope that you carry through with them as a tool in management of range vegetation.

Your preparers have written and excellent Draft EIS. Please tell them so.

Sincerely,

Harold F. Heady

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Response to Comment Letter 23

23-1 See response 20-2.

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24

To BLM.,

I have read your DEIS for a Statewide Vegetation Managment Program. I see many, many things you have not addressed. The biggest being response to and acknowledgment of public outcry
24-1 against such a program. You have not left us with much time to read +
24-2 evaluate your ideas. You are required to have a scoping period. You are
24-3 also required to make your documents legible to the lay person and also
factual. I found much of it hard to decipher and much of what you want us to think about 24D, Picloram, Round-up set untrue to my experiance with victums of

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from these chemicals.

I have seen people die from these chemicals. 245T + 24D - Agent Orange. 24D + Picloram - Agent white. Remember Vietnam. Two of the chemicals of choice are 24D and Picloram. Together they make Agent white. A deadly to humans substance. There is no way I will sit back and let you spray in
4-33 the Area I live, work and play with My children. This is not an acceptable program, There are many many who feel this way and we will do everything we can to stop it. Im urging you. We have shed blood in wars to be able to be a free people, to live in the way we chose. I have chosen a spray free exsistance. I eat a certain way, avoid certain places all so I can live in my way.

I urge you to consider the opinions of the locals! GO THERE. talk to people on the streets. HAve lots of hearings. Lets see what the PEOPLE, not the Corporations, have to say.

24-4 In your reports you've said that these are harmless substances. In fact they cause misscarriages and birth defects. I know, I've misscarried. From being sprayed. I've seen deformed Babies. I've seen friends who've worked in the woods all their life get Cancer and die. How can you think this stuff is harmless! Young friends too!

24-5 Also you never once look at how it will effect wildlife. not clearly. Nor water! Are these not resources?? You are required

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to look at ALL the resources.
Deer, Elk, Fish, WAter Sources
There are many resources. We hunt
24-6 up here. We eat the meat. What
if our deer drinks your sprayed
water. That toxin ends up in my
System. That is NOT OK with me.
Poison Yourself! I dont want it!

I would say in general you have
not determined the Impact of
such a managment program.

24-7 These substances have not been
fully tested as they are still
'unregistered' and 'unregulated' by
the E.P.A.. Dioxin; the worst known
24-8 toxin is a by product of 24D. Both
24D and Picloram and their by products

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24-9 are known to leech easily.

Almost all the targeted Areas are
in Humboldt Co. 5200 acres by AIR(!)
24-10 per year in Humboldt Co.? 40,000 acres
willow creek + Arcata! What!
8,750 POUNDS of 24D plus thier
solvents (which we don't even get to know
about because theyre "trade secrets"!)

HA! This is laughable. Its also Deadly. This cannot be allowed to happen. What about my children, 30 years from now. What about me. Im only 35. Do I have to live with desease and illness so you can make money? Why dont you gust change your Harvest Policy so you dont have to spray. Sustained Yield. The way the Old People did it. The natives of this land knew sustained yield. This idea that you can just cut and spray is old and out dated. If we are to not Poison ourselves from the planet we must seek and develop new alternatives. Ones that are not so destructive. give it some thought - really. The underbrush, oak, madrone ect is good useable wood. It could be cut + used.

4-35 It could create Jobs, revenue. There are lots of Good ideas. This is a much better way. By spraying with no regards to the locals you'll just make enemies, angry ones. This you don't want, so set up a time to get together and listen to the locals. Really hear them. We could all brainstorm some new

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managment programs. It'll be alot easier than having a battle on your hands.

Listen to The people who live here and give up This incidious program of spray spray spray.

Sincerely
Rebecca

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Response to Comment Letter 24

24-1 The comment period ran from December 7, 1987, to February 15, 1988, or over 60 days. The minimum required period is only 45 days. In addition comments were accepted and utilized on into March.

24-2 Scoping letters were mailed to nearly 1,700 addresses, 300 media and noted in the Federal Register in March 1986. From this effort input was gathered from the public and the initial DEIS mailing list developed.

24-3 Other comments have complimented the readability and thoroughness of the EIS, see letter 23 for example.

24-4 No, we have acknowledged that use of chemicals has risk. Appendix H addresses their toxicity, mutagenicity, carcinogenicity, etc. What we do say is that with proper procedures and safety precautions risk can be reduced to an acceptable level.

24-5 See pages 3-18 to 3-22 and Appendix L for the wildlife impact analysis.

24-6 The possible doses for each herbicide under several scenarios in deer meat as compared to documented unsafe levels is addressed in Tables C-33 to C-122. Cancer risks for those doses are shown in Tables C-139 to C-143.

24-7 Only herbicides registered by EPA and the State are proposed for use.

24-8 Only one dioxin, 2,3,7,8-p-tetrachlorodibenzodioxin (TCDD) is of toxicological concern. It has not been shown to be a contaminant of 2,4-D. There are about 75 compounds loosely referred to as dioxin, none of these has near the toxicity of 2,3,7,8-p-TCDD.

24-9 Leachability of each herbicide is discussed in Appendix F.

24-10 No, Table 1-3 shows that the majority of herbicide use is proposed for sagebrush, chaparral, and valley grassland communities. These communities are not found in Humboldt County and account for over 80 percent of the proposed treatments.

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25

SAFE
Alternatives for our
Forest
Environment

10 February 1988

California State Director
Bureau of Land Management (932)
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

Dear Mr. Blakeslee:

Re: Draft Environmental Impact Statement
California Vegetation Management
December 1987

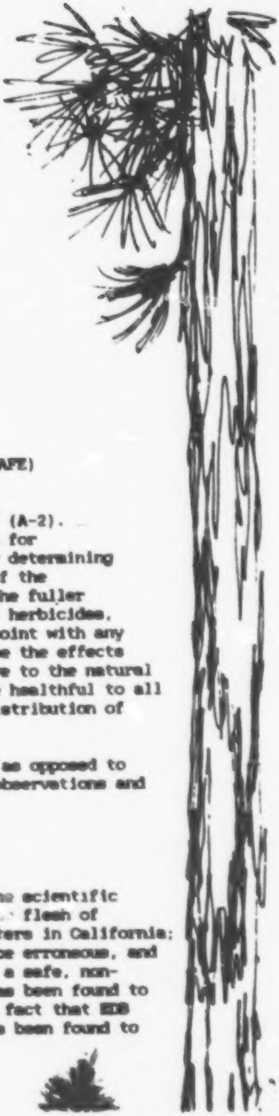
The members of Safe Alternatives for our Forest Environment (SAFE) submit the following comments on the above DEIS.

SAFE sees little difference between Alternatives 1 (A-1) and 2 (A-2). Both proposals are basically calling for an herbicide solution for vegetative management, and attempt to justify this position by determining (in the Summary) that no significant risk exists in any part of the environment from the use of herbicides. We believe, that in the fuller discussions regarding the specific risks related to the use of herbicides, and in the tables provided, the DEIS does not establish this point with any degree of certainty. SAFE supports Alternative 3 (A-3) because the effects of alternative methods are better known, and are less intrusive to the natural balance of nature. We believe A-3 is more economical and more healthful to all living things and provides a greater potential for jobs and distribution of income from those jobs.

We set forth some of the reasoning behind our support for A-3 as opposed to A-1 and A-2, based upon our evaluation of this DEIS, our own observations and insights.

I CREDIBILITY (P-2-22)

SAFE takes the position that there is no credibility gap in the scientific findings that Ethyl Diethyl Bromide (EDB) has been found in the flesh of fruits and vegetables as well as in surface and subsurface waters in California; nor is there any difficulty in finding reports, now known to be erroneous, and to have remained erroneous for over two decades, that EDB is a safe, non-residual herbicide that dissipates rapidly, when in fact it has been found to be readily absorbed into vegetables and fruits. It is also a fact that EDB
25-1 | does find its way into surface and subsurface waters. EDB has been found to be carcinogenic and persistant.



There is no credibility gap in establishing that "Agent Orange" has a detrimental effect upon humans and other forms of life, and that the government and the manufacturers persistenty denied these claims were valid until health officials provided irrefutable evidence to the contrary.

No question of credibility exists about the numerous cases on record where scientific evidence and investigative actions have established beyond a reasonable doubt, that many of the herbididdes and pesticides the government permitted to be sold were inadequately tested and that intertional deception to gain product approval has been practiced by the chemical companies. There is no lack of credible evidence that many of these herbicides remain on the market, untested, inadequately tested, or based upon test data fraudulently submitted.

Valid substantial evidence exists in state records that many wells and watercourses are contaminated by herbicides and pesticides from agricultural use, including by runoff, drainage and spray drift of these chemicals. There are existing complaints of tasting "Bolero" in the drinking water in Sacramento, state capitol of California.

No evidence has been submitted to contradict, or prove invalid, medical findings that agricultural workers suffer from a higher cancer rate than non-agricultural workers and the cause is suspected to be herbicide exposure.

4-37

Records exist that cluster groups are beginning to appear with higher than normal leukemia and other cancer rates, and cluster birth defects are occurring in small farm communities and in areas near toxic waste dumps. Preliminary investigation point towards herbicide/toxic waste exposure.

SAFE takes the position that the DEIS does nothing to alter the credibility gap that exists between members of the public, and the government, or the chemical companies, but does much to sustain a question of credibility of the government and the chemical industry. We do not feel that BLM examined the evidence that supports the questioning of government and chemical companies' credibility. If BLM had done so, it could not justify dismissing dangers of herbicide use as insignificant.

II EXTENT OF CONTROVERSY REGARDING HERBICIDE USE

The records establish that WE, THE PEOPLE have compelled enactment, through court proceedings, through initiative, through letters and demonstrations, through legislation, through volunteer sacrifice of time and money, of the Clean Air Act, the Clean Water Act, the Superfund and other environmental acts on the federal level. In California the people have influenced legislation and passed initiatives for clean-up of toxics on the state level; the last being Proposition 65, the Safe Drinking Water and Toxics Enforcement Act.

On a local level, Trinity County outlawed phenoxy based herbicides and fought court battles to control herbicide use on a local level. Trinity County is on record as being opposed to any aerial spraying (to forestry herbicide use). In 1985 the County passed a Water Quality Ordinance establishing a no detectable discharge policy for polluting substances of controllable water quality activities which may cause the waters of the state flowing through the County of Trinity to be degraded.

2 SAFE finds it difficult to understand the BLM statement in the DEIS that they have no idea of the extent of the intensity of the public's concern regarding herbicides.

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Further evidence of the lack of confidence in state and federal agricultural departments' testing and evaluation of herbicide safety is expressed in the upsurge in the public's purchases of organic fruits and vegetables. The public is also supportive of some market chains use of private testing laboratories to test non-organically grown food for pesticide/herbicide residue, free from government and chemical corporation influence. SAFE believes it is reasonable for one to determine from the people's voting and buying actions that there is an intense concern about herbicides that is negative towards herbicide use.

III MAKING JUDGMENTS ON OTHER THAN SCIENTIFIC EVIDENCE

BLM expresses the opinion that conclusive analyses may not be completed for years on some chemical effects and decisions regarding herbicide use may have to be made in view of social and political views (PG 2-22). SAFE takes the position that BLM does not
25-2 know the intensity and depth of feelings against herbicide use, and has avoided responding to, or explaining how numerous reported and documented cases of significient damage to the human and natural environment could have and did occur from herbicides, which when applied were believed to have only insignificant risks. Thus BLM has not shown in the DEIS that their investigations prior to making their judgments are sufficient to justify their conclusions. SAFE believes that political decisions have no place in this arena. A more enlighted approach would be by judging and examining all of the evidence under the standards of law and justice - making decisions that are beyond a reasonable doubt - after reviewing all of the evidence or, at the very least, by civil law standards - and by a preponderance of the evidence.

IV REFERENCE TO LACK OF COMPLAINTS IN AGRICULTURE

25-3 BLM, in this DEIS, appears to be attempting to bolster support for A-1 and A-2 by making reference to the lack of complaints regarding herbicide use in agricultural areas. We do not believe that is the opinion of the American farm workers or their most active California union, the United Farm Workers (UFW).

Farm workers are migrant workers, remembered during harvest, forgotten and ignored in off seasons. Many are illiterate, or "illegally" in this country. As working poor, they are effectively barred by economics from receiving medical treatment in this country and have a tendency towards self treatment of injury or illness without necessarily being able to determine the cause. Because of the migrant nature of their work and the rapid turnover in workers, they are not as identifiable as being victims of herbicide exposures as farm owners who reside permanently in agricultural communities (who already show higher incidents of cancer, birth defects than the general public). One of the main issues of those representing migrant farm workers in California is the effects of herbicides upon the workers. SAFE believes the absence of complaint is more the absence of investigation.

V CHANGE OF ATTITUDES TOWARDS PROFESSIONALS (2-22)

BLM raises the issue that the public no longer wants to leave resource management to the professional, and the public wants a larger say in how our resources are managed. SAFE agrees with this assessment. SAFE members are no longer content to leave resource management to "the professionals". We believe too many professionals have based their decisions, not on what the resuurce can effectively produce without destroying that resource, but on how to exploit the resource beyond its capacity in a way that conceals political mismanagement of the economy. SAFE believes the resource base supplies the

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As more and more political pressure is placed upon government professionals to produce more short term economic benefits from the resource without looking at the long term economic loss this causes, the quality of our environment and the strength of our economy diminishes, as does our base of true wealth, our natural resources. Herbicide use provides at best an illusory short-time economic gain and in reality produces a long-time economy loss.

In assessing real gains versus illusory gains, we believe resource managers, economists and politicians must factor in other major costs directly related to the herbicide applications to field or forest. Some of these costs are:

1. Chemical spill clean-up.
2. Health Treatments due to herbicide exposure.
3. Lifetime care for those born with birth defects due to herbicide exposure.
4. Subsidized research and development of herbicides.
5. Research to learn how to dispose of these chemicals and how to extract them from drinking water.
6. Testing of herbicide residues in food and water.
7. Maintenance of hazardous waste dumps.
8. Storage of chemicals too toxic to dispose of safely within present technology.
9. Maintenance of private insurance with public monies to insure chemical companies against loss due to government recall of their product. (indemnification)
10. AND the hidden costs — costs that can seldom be recovered:
    - A. Loss of respect for goverment professionals and institutions.
    - B. A lack of faith in a government system where votes so often can be correlated with campaign contributions.
    - C. The deterioration of our environment.
    - D. The cost of suspicion, violence and despair these actions and effects bring upon a society.

VI COST-BENEFIT RATIO AND BLM INCOME FROM GRAZING

SAFE notes that in the DEIS (3-41), BLM refers to a cost-benefit ratio. We also note that the two main areas where herbicides will be used are rangelands and timberlands, lands most likely to have the most vegetation, wildlife and water resources.

25-4 BLM claims a net gain of 72 million dollars (1985) from BLM lands with $500,000 of that total from grazing or AUM's (Animal Unit Month). There were 125,000 AUM's returning this $500,000 which equates to a return of $3.20 per AUM. Nine million acres were utilized which averages out to 72 acres per AUM with a net return of $.044 per acre per AUM. SAFE does not believe this justifies the use of herbicides for removal of noxious weeds and "undesirable" plants from rangeland in return for so little benefit.

VII WEED CONTROL AND BLM'S MANDATE

SAFE agrees that BLM has a mandate to rid lands under their control of certain noxious weeds and undesirable plants under the Weed Abatement Act.

25-5 SAFE takes the position that this is not a mandate for herbicide use. SAFE believes BLM also has a mandate to follow NEPA, the Clean Air and Water Acts, and the expressed will of the people contained in other environmental acts at federal, state and local levels.

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VIII HAZARDS CONNECTED TO A-3

BLM officials state that under A-2, and particularly under A-3:

1. There are hazards of physical contact with irritant weed that cause blisters, inflammation and dermatitis.
2. That sensitive individuals can react severely to the pollens, and that close contact of hand pulling could cause major discomfort or health risk.
3. A severe hazard of hand pulling is the high potential for snakebite.

SAFE's response:

1. Hunters, fishermen, hikers, shepherds, forest workers and most resource users also face these hazards which are natural risks.
   - A. Few are life threatening.
   - B. Most can be cured with over-the-counter drugs without the need for expensive medical treatment.
   - C. Few, if any, are reoccurring without recontact with the plant.
   - D. Most poisonous plants must be ingested to produce death.
   - E. Most of the risks can be avoided or diminished by knowledge of plants, wearing protective clothing and use of soap and water.
   - F. Herbicides can not be seen on plants, in soil or water and cannot be readily identified.
   - G. Chlor-acne dermatitis caused by herbicides does not require recontact for a reoccurrence and is extremely difficult and expensive to treat.
   - H. Herbicides can be ingested without knowledge, causing effects not readily apparent.
   - I. Outbreaks of rash or other noticible effects of reactions to plants generally take place within a short period making cause and effect easier to determine. Herbicide exposure may cause kidney or liver damage, birth defects, etc. long after exposure.

2. Sensitive individuals can react severely to pollen in the air, or be stung by insects, in their own back yard. SAFE believes persons with a high degree of sensitivity to the outdoor environment generally avoid employment in natural resources. However,
   - A. Sensitive persons can learn to identify insects and sources of pollen, but persons sensitive to herbicides and other chemicals, unless use areas are posted, cannot.
   - 25-6 B. While BLM is concerned about the effects of natural events effecting sensitive individuals, no mention is made about those sensitive to largely undetectable man-made chemicals in the environment.

Recent medical theories support two theories:

(1. The human body contains within itself a threshold of resistance to germs and chemicals. When this threshold is breeched, the adverse effects gain a foothold in the body.

25-7 (2. Some effects are cumulative in nature so that resistance today does not guarantee resistance tommorrow. Pesticides are known to be cummulative and move upward through the food chain as one form of life consumes another with man at the top of the ladder.

In view of this SAFE believes the risks presented to sensitive people are greater in the chemical environment than in the natural environment.

3. SAFE appreciates BLM's concern for protecting workers from snakebite, but SAFE takes the position that this is a known and acceptable risk. It is estimated that 20,000 cancer cases occur per year from herbicide/pesticide caused cancer. Snake bite death levels are minimal. Snake bite is less a threat to resource workers doing manual work than to resource users. Workers are generally armed with sharp tools, by necessity of employment, and have reasonable physical agility. They are acutely aware of the danger. Much brush removal is done during the coolest portions of the day, reducing snake activity. The most dangerous snake in California is the rattlesnake, which is noted for its shyness and lack of aggressiveness unless annoyed, surprised or cornered.

IX SAFE'S EXPERIENCE WITH BLM'S PROJECTED HAZARDS AND DIFFICULTIES ENCOUNTERED IN MANUAL ALTERNATIVES

In order to prevent a planned "cut and squirt" operation from taking place in Junction City, Trinity County, SAFE members and others in the community volunteered to gird the trees. BLM officials expressed concern that volunteers could do the job within a specified time frame and estimated it would take two weeks of hard work on difficult steep terrain in rattlesnake infested country. Volunteers, from teens to older retired adults, male and female, armed with knives, hatchets, meatcleavers, bayonets and pruning shears, signed waivers and proceeded to do the job. Few had experience, many had sedentary jobs. In one and one-half days, the girding was finished and passed BLM inspection. Two rattlesnakes were dispatched by hand tools (and eaten) without incident.

X TABLES AND EXPOSURES

The DEIS states that data gaps exist because of the exorbitant cost of research which SAFE has already pointed out is an expense that should have been and must be included in estimating the true cost of herbicide and pesticide use.

SAFE points out that herbicides and pesticides are the off-springs of chemical warfare, used in past conflicts against humans to the detriment of both sides. This country now has extensive stores of poisonous gasses in corroding containers with no place to dump them. We are now building up huge stockpiles of herbicides and pesticides, removed from man's arsenal of weapons in his war against nature; recalled because their use proved to be detrimental to both sides. We have no place to put them, nor sufficient funds to pay for the research to find a safe way of disposing of them.

XI TABLES AND SYNOPSIS

5-4 Although tables and individual synopses under each of BLM's proposed herbicides contains statements relating to significant risks, with toxicity levels ranging from mild to acute, BLM reduces all of them to the level of insignificant in the Summary. SAFE does not believe conclusions in the Summary, drawn from the tables and the synopses are valid conclusions.

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Use of herbicides on timberlands and timber harvest receipts:

BLM reported a net gain of 72 million dollars from BLM lands with only $1,010,000 from timber sales (2-20). BLM claims a 25 percent reduction of the cut without intensive management (2-11) and claims herbicides are necessary to sustain 10% of the cut. BLM claims a 20% reduction (2-20) if A-3 is adopted, and a slight increase in total forest 25-9 development costs will occur under A-3. BLM claimed it could meet the annual cut needs without herbicides but claims that it is imprudent for management to spend unlimited funds to reforest some lands. SAFE points out there is a vast difference in "slight increases" and "unlimited funds". As previously stated BLM has failed to include all of the costs of herbicide use currently being borne in the budgets of other departments, i.e. health, research, toxic clean-up, etc. SAFE's position is that federal funds are taxpayers funds, income received from public lands are taxpayers receipts.

By absorbing only a portion of the cost within BLM's budget and passing the greater costs on to other departments, BLM officials are attempting to balance their budgets through deception. If all true costs of herbicide use were pro-rated and given back to the department that used the herbicides the slight increase BLM professed it would need for development costs without use of herbicides would, in comparison appear to be a profit. As all government funds belong to the people, hiding true cost and shifting them on to the other departments does not constitute a savings; it escalates the problems in allocating funds fairly.

25-10 BLM officials admit (3-8) that herbicides would not necessarily eliminate all competing vegetation but would temporarily reduce competitors. This is listed as a major drawback of A-3, and treated as insignificant under A-1 and A-2.

25-11 Without going into herbicide effects on other aspects of the environment on (3-9), BLM admits spray carriers could kill or damage conifers, herbicide injections could increase fire hazards and non-target species adjacent to spray units would be harmed, but makes no assessment of costs when these occur, or costs of preventative measures.

25-12 A-3 requires more labor which in turn creates a larger tax base and expansion in the local economy. BLM should consider broadening the taxable base. How much is returned, directly and indirectly, to the government when payments are made to many workers over few payments to chemical manufacturers and distributors? Which has the most effect on the local economy?

Exposure Level Risk

BLM, while admitting we live in a chemical environment, sees little risk for human or animal exposure at levels cited, and little risk of synergistic effects or cumulative effects (3-38/39) occuring. SAFE's position is that man does not live in sterile isolation. He is confronted with chemicals in his food, water, soil and air everywhere on earth. As the use of toxics rise, so do exposure levels. To judge exposure possibilities based on probabilities and assumptions, however inaccurate, could only apply to that specific chemical used in that specific location at that specific time. SAFE believes that government agencies should begin to reverse this trend in view of present toxics contamination today and projected contamination of the future.

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The DEIS states throughout, in its discussion of herbicide use, that there are significant risks to some species of life. SAFE takes the position that no government agency has a right, in view of man's demonstrated ignorance of our environment, to take the position that the gain of food and fiber justifies killing all life unable to resist herbicides, and to assume that the lifes exterminated have no bearing on the lives of surviving species.

Atmosphere and Drift

BLM regards herbicides as an insignificant risk to air quality and dismisses spray drift as controllable. BLM dismisses air crashes and other spray pollution incidents as unlikely despite the record of the USFS, 1980-1983 - 14 accidents involving sprays.

25-13 BLM states drift occurs normally only when there is a severe temperature inversion and low wind velocity, conditions generally found in California. BLM apparently believes it can also control down drafts, sudden shifts of wind, wind shear and other air turbulence by labeling the risks as insignificant.

4-40 BLM claims air mixing and lofting of the chemical materials to higher altitude can occur (3-1) and suggests that it is entirely possible that the particles will be sufficiently scattered and degraded to not pose a problem. Not stated is that chlorofluorocarbons have risen to the stratosphere and are believed to be reapnsible for destruction of the earth's protective ozone layer. What goes up must also come down is a widely accepted theory. Acid rain from smoke rising up in middle America falls upon Canada and New England. SAFE questions whether herbicides, or elements of herbicides, unite with oxygen and hydrogen in the air and come down elsewhere.

25-14 SAFE believes the preparers of the DEIS lack sufficient background and experience to judge for the people of the effected areas, and the world, what risks to human, animal and plant life are acceptable. The data upon which BLM makes this political judgment (from an unelected position) is faulty and the understanding of social effects is admittedly minimal.

SAFE agrees that we live in a chemical society; indeed, man himself has become a personal victim of chemical abuse, from narcotics like heroin and morphine to drugs like barbituates and nicotine. Like the effects of herbicides upon different species of life, some narcotic and drug users have avoided death, cancer and related problems, others have succumbed to death and disease. Used primarily to satisfy one's self, the adverse costs of narcotic use has been passed on to society. Herbicide use presents the same problem. Few benefit while society pays for its use. Narcotic users seek a physical and mental euphoria that cannot long be maintained or sustained. Herbicide users seek the euphoria of increased production of food, fiber or profits, which cannot be maintained or sustained. We are addicting the earth as well as ourselves. No agency, governmental or private, no individual or group has the right to turn this planet into a "junkie planet". SAFE urges BLM to just say no to A-1 and A-2, and yes to life, a safe life, by implementing A-3 as the prefered alternative, and begin working with nature instead of trying to conquer it.

Sincerely,

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Response to Comment Letter 25

25-1 EDB is a fungicide and not proposed for any use in this program.

25-2 Statement regarding controversy has been changed, page 2-22.

25-3 The reference to agricultural use has been deleted.

25-4 You have used the number of livestock in your calculation rather than AUMs. Actually there were 387,000 AUMs returning $1.30 per AUM. The grazing fee was actually $1.35 but due to rounding down to $500,000 the calculation results in $1.30. Using the corrected value results in 23 acres per AUM and $.059/acre. It must also be remembered that this is only a livestock forage valuation and that other resource values exist such as wildlife forage and habitat and water yield.

25-5 This EIS is prepared under NEPA requirements and the other aspects you list all enter into the decisionmaking process through the NEPA process.

25-6 Mention is made of the lack of a chemical free environment under Cumulative Effects on page H-121.

25-7 Pesticides are not necessary cumulative, biodegradation elimination from organisms and other breakdown occurs, see Appendix F discussions.

25-8 The insignificant conclusion is related to the expected doses to which the public may be exposed, not the toxicity of the undiluted chemical which does not occur except in a lab situation.

25-9 The resulting impacts have been reworded on page 3-17.

25-10 This is true because under Alternative 3 the ability to control competition would be less than under either Alternative 1 or 2 and becomes more of a factor, thus it is a consequence of Alternative 3.

25-11 It is also stated that application techniques can mitigate these effects.

25-12 It is noted on page 3-25 that the overall economic effect of any of the alternatives is insignificant except for localized situations. These situations can not be addressed at this time and will be considered during site-specific project analysis.

25-13 BLM makes no claim at being able to control the weather, however, by being aware of unsatisfactory conditions we can do our best to avoid those conditions if herbicides are applied.

25-14 This is precisely the reason the public is involved in land use planning done by BLM and why EISs such as this are circulated to interested individuals and other responsible agencies.

Feb. 8, 1988 26

To: Mark Blakeslee C/O Cal. State Director, BLM
From: Central Sierra Audubon Society
P.O. Box 3047
Sonora, CA. 95370

Dear Mr. Blakeslee:

Despite the great amount of material and computations provided, the DEIS (1) violates NEPA in some basic, vital areas (2) provides certain false and biased information and (3) fails to adequately address public concerns.

The following comments are based on a complete and careful scrutiny of your document.

NEPA: NEPA (40 CFR 1500.2 [e]) requires Federal agencies to identify and assess the reasonable alternatives to proposed actions... In this DEIS, there are only two basic choices provided (A) NO spray or (B) 2000 acres or more of spraying annually. There is no alternative that would allow spot spraying of noxious weeds in critical areas least likely to affect other resources. Likewise, there is no low-level chemical use alternative relating to forest management. 26-1

4-41

Second, 1500.1(b) states: "NEPA procedures must insure that environmental information is available to public officals and citizens before decisions are made and before actions are taken."

Yet the DEIS proposes:

(A) use of 16 chemicals, many of which have not met the full range of toxicology and human exposure testing or data projections,

(B) equally significant, (3-39) "the toxic effects of many of the possible herbicide combinations have not been studied" relating to synergistic potential. Such problems are simply dismissed.

(C) and Further, although the proposed herbicides mostly do not contain inert ingredients known to be of toxicological concern, EPA has almost no data fully submitted for inert ingredients..thus the fact that there is "no evidence of toxicity concern" often simply means no testing has been completed.

The uncertainty of these three areas plus other omissions violates the requirement that information be available prior to action. Any chemical program proposed should not include any chemicals, active or inert, that have not met the full range of toxicological testing. 26-2

A third NEPA violation, 1502.8 requires an EIS to be written in plain

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language...so that decisionmakers and the public can readily understand them. 26-3 Despite careful study of the risk assessment section, it is extremely unclear exactly how dosage intake, body weight, incidence of exposure and duration combine to produce proposed projections. In contrast, the USFS vegetation management supplement, 1986, used similiar formulas yet made clear explanations of the process so it was understandable how results were achieved.

Last, 1502.1 requires "full and fair discussion significant environmental impacts," yet a fair, open-minded review of this document reveals considerable bias and false information. This bias makes this document unsuitable for basing a program on..(please see the following section).

BIAS: The authors, despite noting that chemical critics believe they are biased toward herbicide use, go right ahead and favor chemical use in almost all judgemental statements or analysis.

26-4 One prime example is the constant explanation that local communities will suffer economically if chemical use is not chosen. Such sentiment is always stated first (iv) (1-14) and often cited as the dominant theme (see 3-22, 23,24 for some examples). On page 3-24 the authors talk about the loss of "100 jobs in two small towns". Since the only real difference between alternatives is the difference between spraying or not spraying, it is obvious that the authors are claiming that the loss of those 100 jobs in two small towns would be due to the no spray alternative.

The truth can be found in figures elsewhere in the DEIS. On page E-1 the difference in BLM costs between Alt.1 and the "no-spray" alternative is shown to be only $53,500. On page 3-23, timber revenues are projected to be $202,000 more for Alt. 1 than Alt. 3. Although this figure is in error (see economics later in this comment) even accepting it shows at most a total difference of $250,000 in potential revenues for local economies.

Divide that $250,000 figure by $10,000 (a poverty-level job for most families in America) and at most, 25 full-time jobs in the entire EIS region might be created by choosing Alt. 1. Amend that still further since $156,000 26-5 in aerial spray monies will be going to aircraft spray companies with little local profit, and in reality, the total local jobs affected in the entire EIS region will likely be 20 jobs or less.

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Compage this with the authors' projection of the loss of 100 jobs in just two small towns and their discussion of how local economies often rely on vegetation management for economic support. The truth is, even on a local scale, the difference between alternatives is economically insignificant.

Further bias is found in the authors statements in the "impacts on social environment" section, 3-24 that people who like herbicides fear job losses and being forced to go on welfare if herbicide use is limited. Although this sounds touching "who'd want to force hard-working Americans to go on welfare?',
the same exact logic could have been stated for manual release workers. If
26-6 aerial spray is used, there will be far less money spent on hand release. Of
course, the pro-spray authors never would write that these manual release
workers worry that they will be forced go on welfare if aerial spray is used.

More Bias: Discussion of manual treatment methods constantly downgrade results
(1-10,3-12,3-14) claiming failure, injury to 20% or more of conifers, and
resprouting of cut brush density "to above pretreatment levels". Such criticism
is clearly intended to make manual treatment appear ineffective compared to
26-7 herbicide. In most cases the claims are mostly or completely false.

Manual treatment methods are used locally in the forest and have been for more than 10 years. On No lands that brushhas been cut or scalped has the brush ever "quickly regenerated to above pretreatment levels". On no sites has manual treatment damaged 20% or more of the trees. And on most sites, treatment has effectively allowed crop trees to out-grow competition.

On the contrary, use of 2,4-D and glysophate has been ineffective at least a substantial portion of the time, with target vegetation only "burned" but not killed. Accordingly, repeated chemical treatments have been required, increasing both project costs and potential accumulation of chemical residues in soils and nearby waters.

Bias can constantly be found (3-9) "The overall objective of managing
competing vegetation with use of herbicides would be to improve ecological
and natural plant composition....(this is double-think. Herbicides kill off
26-8 ecological diversity and most natural plants)...provide for favorable herbage
production, improve watershed protection (again, double-think, killing plants
increases erosion and damages watershed, not improves protection)...enhance
wildlife habitat...(a clear falsehood. Even the DEIS admits (3-17) herbicides
will have "adverse effects on wildlife" and [illegible]

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All the above misstatements and errors are contained in a single paragraph; the same bias and mistakes can be found throughout the document.

ECONOMICS: 3-23 claims loss of timber revenues under the "no spray" alternative would be $202,000. Pg. 2-20 says timber receipts are $1,010,000 annually. Then page 2-11 says "the use of herbicides is the only method to maintain 10% of
26-9 the allowable cut".

Since 10% of $1,010,000 is approximately $100,000, not $200,000, timber revenues lost under Alternative 3 would only be $102,000, not $202,000. Note, timber related job impacts would thus be even less than the 20 jobs regionally discussed above, more likely 10 or less.

BIAS AND ECONOMIC SUMMARY

We believe we have clearly shown above that bias and false information are the basis for much of the materials in this DEIS. We point out other problems or suggestions below.

Where Sprays to be used-

We object vehemently to the aerial spraying of 4600 acres each year for range "improvement" or "conversion". Grazing on BLM land already costs taxpayers more than it brings in when all administrative costs, predator control costs, range improvement costs, maintanance costs, and environmental costs are added together. Grazing impacts streamside areas, especially in arid lands, erodes stream banks, pollutes the water with defecation and giardia, detracts from recreational uses and impacts many species of wildlife. To spend large sums of taxpayer money to convert lands into rangelands only to benefit range permittees without fully discussing the social and economic benefits is illegal and a violation of NEPA. To do so with potentially contaminating chemicals, even if considered safe, shows contempt for the general public.

We also strong object to the proposed use of herbicides on recreational sites. To spray trails and campsites with chemicals shows a lack of sensitivity to the entire herbicide controversy. People most likely to object to chemical use on Federal lands are those most likely to actually use those lands for recreation. They are the ones most likely to sit on ground recently sprayed or to hike trails recently sprayed.

26-10 On the same issue, to place signs only in sprayed areas for 2 weeks seems unwise considering that many of the listed chemicals last up to a year in arid soils. If chemicals are still chosen despite our comments on this projects, signs should be displayed visibly for at least 6 months after spraying, explaining what was sprayed and when.

Risk Assessment---The heart of this document is the risk assessment, which produced the prediction that 100 gallons of 2,4-D dumped in a large pond 26-11 would only harm 8 people out of one hundred million people (8 out of 100,000,000). To say that the risk assessment is biased is an understatement. Even worse, it is misdirected.

To try to justify the use of picloram or 2,4-D by numerically extrapolating data derived by lethal dosages of test animals is not reasonable. Except in some phenomenal accident, no one, even workers, is likely to be poisoned by these herbicides. The concern herbicide critics bring to this DEIS is that lab results showing 2,4-D or asulam or triclopyr to have fetotoxic or mutagnic 26-12 or carcinogenic results at high laboratory doses indicates a "potential" for the same kind of problems in real life. People vary tremendously in sensitvity to various substances. What may be "safe" for a rat may not be safe for a sensitive person.

All risk data discussion emphasizes how conservative the projections are, yet reality is quite different. We have talked with numerous Forest Service and private workers who have worked around helicopter spraying and backpack spraying. Every single one, even those indifferent to its dangers, admitted that every backpack spray worker often was drenched with spray running down his back or arms. 26-13 Not just 30 times in a lifetime, but all day every spray day. When copters sprayed, there were constant drifting misses, even at no visible winds. And mixing or spilling accidents happen opten, not "infrequently" or "seldom".

All risk assessment also is based on a clean stream, clean worker or clean animal to start with. Reality is again quite different. Each of these is already contaminated with substances from a wide range of other "safe" applications. 26-[illegible] Streams in particular already may have vaarious other spray projects with the same or different chemicals upstream or downstream within the same general period. No matter how you sugar-coat it, to add more to an area increases the risks.

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In closing, our group (which includes almost 400 local members) wishes to point out not only our overall concern with the environment, but our specific area of concern---birdlife. We note that 2,4-D and numerous other of the proposed herbicides affect birds or their reproductive success at varying levels of damage. Simply put...we ask that birds, wildlife, people and beneficial plants be spared such toxic dangers. We ask that you choose Alt. 3 with the modification that allows spraying of noxious weeds by hand where deemed absolutely necessary. We ask that such spray projects have independent, third-party monitoring and testing, that every project be fully signed and that alternative methods be chosen for all vegetation management except noxious weeds.

We sincerely ask that you accept these comments with open minds and that you specifically understand our main concern that under no circumstances should aerial spraying be used on BLM land based on the material contained in this DEIS.

Thank you for your consideration. We look
forward to your efforts to use alternative
methods to meet multiple-use goals.

John A Buckley

John A. Buckley,
Conservation Chair,
Central Sierra Audubon Society

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Response to Comment Letter 26

There are three levels of chemical use none, low level (1,850 acres) and high level (6,900 acres). The high level is over three times as great as the low level. In addition, aerial spraying is included in the high level. Aerial spraying has some of the greatest possible side effects from chemical use, making the relative range of impacts between Alternative 1 and Alternative 2 very large. There also is a low-level chemical use alternative related to Forestry as Alternative 1 proposes 900 acres of chemical use related to forest management and Alternative 2 only proposes 550 acres or 39 percent fewer acres.

26-2 40 CFR 1502.22 addresses how incomplete or unavailable information must be addressed in an EIS. BLM has identified those situations in this EIS and analyzed those uncertainties under a risk assessment scenario. Decisionmakers will thus be provided with the available information as well as be aware of the uncertainties which may be influenced by any decisions, with some attempt made at quantifying those uncertainties.

26-3 The findings of the risk assessment in Appendix H have been summarized in the main body of the EIS in "plain language." The Appendix, as are many technical Appendices, is by necessity written in a more technical manner and included for those readers who are so inclined to find out how the analysis was done. The Appendix has undergone review by qualified toxicologists and has been certified as thorough and understandable.

26-4 See response 11-38.

The EIS does not state local communities will suffer economically if chemical use is not chosen, it does say that economic productivity may vary, and that Alternative 3 would have the lowest productivity, however, that lower productivity is not identified as suffering economically.

26-5 In some cases aircraft spray companies may be local small businesses.

26-6 The statement has been rewritten to reflect that viewpoint.

26-7 The report by Roberts, 1980, documents the statement. While both types of treatments are not 100 percent successful, treatments with herbicides are less costly, disturb less vegetation and soil resulting in less erosion, and do set back competing species enough to lessen competition with conifers. Since herbicide treatment costs less initially it is more probable that retreatment can be afforded if the first treatment fails and ultimately more of the acres requiring treatments will be controlled.

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26-8 The sentence cited describes a land management objective not impacts from implementing actions to reach the objective. The impacts are identified following the sentence cited. Proper use of selective herbicides can control invading species and allow for improved forage production on those managed sites. Selective control of plants does not simply remove plant cover, other species repopulate controlled areas providing often times greater watershed cover. Your reference to 3-17 is taken out of context. The discussion on page 3-9 relates to range management, fuel hazard reduction and other nonforest management treatments, while the phrase you cite on page 3-17 is related to 900 acres of forest- lands. Further examination of the wildlife impacts shows that wildlife impacts are mixed in the range, etc., situation, not necessarily all adverse as implied.

26-9 The dollar value is correct and is based on the expected allowable cut impacts identified on page 3-15 which identify a 20 percent decrease from Alternative 1 to Alternative 3. The 10 percent estimate on page 2-11 is in error and has been deleted.

26-10 The two-week signing period is a minimum and would be longer if required by label guidance or State laws.

26-11 Evidently the reviewer feels more people would be affected in this situation. The number quoted only refers to cancer risk, not acute toxicity, general illness or other noncancerous illness. The calculated noncancer margins of safety for the situation are shown in Table C-127.

26-12 The potential for these problems is addressed in Appendix H and the risk numbers are an attempt to demonstrate the relative differences of risk between the different chemicals and different application methods.

26-13 The doses to workers are based on actual field studies of workers (page H-52 for example). In addition, the number of exposures to workers is not only 30 occasions. On page H-68 the development of the number of exposures is discussed using expected number years of employment and a realistic number of days per year based on the workload attributed to the proposed BLM spray program. Instead of 30 exposures for a backpack sprayer Table B-24 shows a realistic scenario of 50 exposures and worst case number of 440 exposures.

26-14 While it is true there may be existing background levels of man made chemicals in natural systems, BLM does not propose numerous treatments for any one area. The most likely scenario is only one large-scale treatment will occur on any one area within a ten-year period.

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Tuolumne Group, Sierra Club
P.O.Box 4440
Sonora, Ca. 95370
February 7, 1988

California State Director
Bureau of Land Mangement (932)
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, Ca 95825

Dear Mr. Blakeslee,

The following are our comments on the Draft Environmental Impact Statement (DEIS) for the California Vegetation Management program of the Bureau of Land Management (BLM). The intention of the DEIS is to describe and analyze "the environmental impacts of implementing a program to control vegetation on public lands in California and northwest Nevada." Instead, the BLM has produced a confusing and poorly written document clearly biased in favor of herbicide use. It lacks complete information about the program, documented need for vegetation management, and a full range of reasonble alternatives. It is inadequate in its ability to accurately determine impacts and its consideration of potential environmnental consequences. It is filled with questionable judgments and guesses and false or misleading conclusions.

Accordingly, we ask that these problems be corrected, that this document not be allowed to stand as a basis for vegetation management, and that a new document with a better selection of alternatives be available.

We support Alternative 3: No change/no use of herbicides. We support vegetation management by manual, mechnical and prescribed burn methods.

HEALTH CONCERNS

A major inadequacy in the DEIS is the BLM's failure to fully consider public concerns over the use of herbicides and their adverse effects on water quality and human health. According to the Medical Coordinator of the California Department of Food and Agriculture, "There is great concern by both the public and medical community regarding the potential for chemicals to induce birth defects, cancer, and neurological damage". Despite these widespread concerns, BLM did not consider it important to "undertake a detailed social analysis of the EIS area that included a population profile, demographic analysis, institutional analysis, or formal public opinion survey." (DEIS p.2-20) 27-1

27-2 Data gaps in herbicide research need to be filled before

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herbicide use is considered. The fact that the EPA has approved
herbicides for use is no guarentee of their safety. The accuracy
of EPA's recommendations about herbicides is suspect, since data
provided to EPA is submitted by the chemical companies that
27-2 produce the herbicides. It is doubtful that this information is
unbiased. In addition, all data is based on laboratory
experiments with mice or rats. The studies determine the effects
of high doses on short lives. The public is concerned with the
effects of low doses on long lives. In real life, we are facing
possible low-level contamination of water supplies. Using
lab results of animals may not even start to correspond to the
effects on humans.

The DEIS states that there is little risk that herbicides
would cause mutations, or cancer. On p.3-27 it names specific
herbicides which did not show positive results for mutagenicity
or cancer. But this section omits stating that 2,4-D, picloram,
triclopyr, and atrazine cause birth defects. It omits mentioning
that triclopyr, 2,4-D, and atrazine are fetotoxic. It omits any
mention that 2,4-D, picloram, asulum, and glyphosate are possible
27-3 carcinogens. Finally, it omits stating that atrazine, 2,4-D,
dicamba, fosamine, hexazinone, simazine, and triclopyr all had at
least some positive test for mutagenicity. Research done by
scientists who are critical of herbicides has been omitted. The
BLM has tried to obscure the fact that herbicides are a danger to
human health. The DEIS is written as if the burden of proof lies
with herbicide opponents to prove that chemicals are harmful,
rather than on BLM to provide evidence that herbicides are safe.
Before herbicides are used on public land, it must be proved
beyond doubt, with no scientific controversy, that herbicides are
safe.

On p.2-21, the BLM admits that it is difficult to establish "either the presence or the absence of cause and effect relationships between herbicide use and environmental damage or between exposure to herbicides and human health problems.

A major omission concerning risks and hazards of various
treatment methods to workers and the public concerns the subject
of choice. BLM workers are paid to risk cuts, sprains, falls and
other mishaps when they work on vegetative management projects.
They choose to accept the risks whem they take the job. However,
the public does not choose the risks of air or water
contamination by herbicide treatment of their public lands. The
public does not choose the risk of exposure to herbicide spills,
volatilized spray, off-target drift, or contminated water. There
will continue to be strong vocal opposition to these risks being
27-4 imposed on the general public. The issue of choice is not even
mentioned in the risk assessment.

BLM plans to use chemicals containing inert ingredients which have not shown evidence of being hazardous. However, many of these inerts have not been required to undergo a full range of toxilogical testing. Consequently, long term effects on humans are not known.

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27-5 The DEIS admits that there is a limited amount of data available on pesticide combination, but makes the assumption, anyway, that it is "unlikely" that synergistic effects could occur. In a project supported by the EPA, the Working Group on Synergy in Complex Mixtures, from the Harvard School of Public Health discusses our naivete in understanding the effects of synergy. "Our knowledge of the toxicology of the compound comprising the mixture is likely to vary between poor and nil, and our understanding of the likely or possible interactions is rarely better than guesswork." The likelihood of herbicides, insecticides, fungicides, poison bait, and other chemicals interacting to cause health problems is not unlikely, since many chemicals will persist in the soil.

27-6 The DEIS discussion of cumulative effects is inadequate. The public is constantly exposed to a barrage of carcinogens and toxics. Pesticide residues on food, in water, and air pollution are epidemic. The additional exposure to herbicides used by BLM will increase health risks already imposed on visiors to BLM land and downstream water consumers.

27-7 A number of individuals in the population are more sensitive to the effects of herbicides than others. These people suffer far more severe effects from contamination than the "average" person. The DEIS does not address the chemically sensitive individual.

WATER QUALITY

27-8 Of major concern is the possibility of contamination of the streams that flow from BLM watersheds. The DEIS states that herbicides can enter surface water through drift, accidental direct application, surface runoff, or erosion of previously treated soils. It does not discuss adequate buffer strips, control for drift, proper disposal of pesticide containers and cleaning of equipment, contingency spill plans, monitoring and evaluation of spray program. Nor, does it list in its references a 1977 study for the BLM by John Cameron and John Anderson, "Results of the Stream Moniloting Program". The study states that herbicides, as a result of aerial spraying, entered the stream system either as a result of overspray or direct hits despite efforts to protect streams and buffer strips. It concludes that aerial application of herbicides would result in a 70% chance of herbicides entering the stream system. Water contamination would undoubtably occur as a result of herbicide use by BLM.

27-9 Plans for monitoring water quality are inadequate. If herbicides are to be used, despite public opposition, mandatory water sampling downstream from all treatment areas within 250 feet from any body of water should be taken, in order to ensure compliance with the Clean Water Act. Samples should be taken during treatment, 24 hours later, and after the first heavy rainfall by an independent contractor.

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27-10 The DEIS contradicts itself by establishing a 50 foot buffer zone along riparian areas (p. D-5), and then stating on p. 3-10 and 3-13, that herbicide application would be reduced in riparian areas and would be hand applied. If herbicides are to be used despite public protest, the minimum width of buffer zones should be 300 feet on each side of rivers and lakes, 200 feet on each side of perenial tributaries, and 150 feet on each side of intermittent streams.

PERSISTENCE IN SOILS

One of the most glaring errors contained in the text regards organic matter in the soils of sites where herbicides will be applied. The high organic matter content of soils is constantly used as justification for the likelihood of reduced persistence in soils, reduced mobility or leaching, and reduced chance of contamination of streams. The assumption that spray sites will have high organic matter content is false. In reality, the opposite will be true in the majority of spray sites. Broadcast burning or tractor piling and burning are often used prior to herbicide application. These treatments remove a tremendous amount of organic matter from the site. Extreme heat penetrates deep into soils beneath the pile area, consuming the vast majority of organic matter. Hot broadcast burns consume much of the microflora that would break down herbicides. The low organic content of plantation sites would greatly increase rather than decrease the persistence and leaching of herbicides. 27-11 The DEIS presents misleading information regarding the nature of soils on which herbicides will be applied, which leads to false conclusions regarding their potential effects on the environment.

ECONOMICS

Throughout the DEIS, reference is made to the economic consequences of vegetation management and chemical methods. Although the document admits that, statewide, the impact of any alternative is economically insignificant, it still claims that herbicide benefits, "when considered locally...become more significant." "The local economy often relies to a great degree on the expenditure of dollars for vegetation control." (p. 3-23)

On page 3-23, the claim is made that timber revenues under the "no herbicide" alternative would be $202,000 less per year. Even accepting this figure, this $202,000 would only create, at most, 20 jobs for the entire EIS region, at a poverty level of $10,100 per year. Balance these possible 20 jobs against the peace of mind of thousands of California residents who fear contaminaiton of water supplies and resource lands by chemicals. Then, also consider the economic effects of lost tourism if spraying goes forward.

27-12 A second economic factor also concerns benefits to local economies. Under Alternative 1, a large percentage of aerial spray costs would go to the flight company and a few individuals. Under Alternative 3, a greater percentage of manual release means payments go the many local laborers more likely to spend that money locally. Since major spray companies are seldom local, mamual release would favor the local economy more than aerial.

27-13 Typical bias can be seen on page 3-24 in the "economic impact on socal environment." As stated before, $202,000 is the projected difference between alternatives. Yet, on page 3-24, the second paragraph talks about a loss of 100 jobs "in two small towns with a combined work force of 500." These "jobs" will bring in only $200 a piece per year based on the differnence in timber revenues.

As to economics and range, the logic of spending more than $140,000 a year in aerial spray costs alone to increase range use is unwise when BLM already loses money on many reange allotments when administative and other associated costs are considered.

The DEIS's discussion of economics does not include the additional costs to BLM to attempt to convince the public that herbicides should be used, additional costs for extra law enforcement, additional costs to battle lawsuits opposing herbicide use, and the potential savings in welfare and unemployment. These likely costs should easily offset any possible economic benefits of chemical use. No discussion is given either to the potential for lawsuits of damages arising from spray accidents, off-site contamination, or health effects to workers.

SUMMARY

We supprt Alternative 3: No change/no use of herbicides. for the following reasons. Contamination of resources offsite could be affected by herbicides. Complete and unbiased information on the chemical safety of herbicides is lacking. The potential for chronic, long term adverse health effects to both workers and the public is likely.

Sincerely,

Sheryl Freeman

Sheryl Freeman
Conservation Committee Chair

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Response to Comment Letter 27

27-1 The lack of an opinion survey specific to vegetation control is not a factor which is an issue since BLM has done numerous land use plans and associated EISs throughout the State, forest management plans, and other planning and environmental analyses from which we have gathered public concerns and opinions--including those on vegetation control and herbicide use. The statement was made on page 2-20 to make it clear that the information was not collected solely for this EIS but as a result of other BLM efforts.

27-2 Data gaps are identified in the EIS as discussed in response 26-2. In addition, data may be based on short-lived animals, however, this can be seen as a benefit in that effects that may take a generation or more to occur can be seen in a relatively short period of time as several generations of young can occur within just a few years.

27-3 The first paragraph on page 3-30 identifies those herbicides for which positive or mixed mutagenicity has been determined. Also page 3-31 paragraph 4 refers to the reproductive toxicity NOELs for all 16 herbicides contained in Table H-24. Whether or not any dose which might be received by the public is adequate enough to result in teratogenesis or other effects is another matter and is discussed within the EIS.

27-4 Choice is not addressed by the risk assessment but the feelings of the public are addressed in the social environment sections of Chapters 2 and 3.

27-5 Page 3-41 acknowledges that synergistic effects are possible, however unlikely due to the way chemicals are typically used in wildland situations. Appendix H on pages H-116 through 118 also discusses synergy in detail.

27-6 Under the program proposed herbicides would be used infrequently and in unpopulated areas making cumulative effects unlikely.

27-7 The uncertainty of the sensitive individual's response to exposure is addressed on H-122.

27-8 Appendix D discusses how pretreatment surveys will delineate necessary buffer strips and lists some minimum procedures which will be followed to control aerial drift. The pretreatment survey and pesticide use proposal required for any project will also identify the disposal, contingencies, and monitoring needs. In regard to the Cameron and Anderson study, there are much more definitive and realistic drift studies now available and referenced in the EIS such as Lavy et al. 1980 and 1982.

27-9 Monitoring needs are addressed on page D-5 and are to be further clarified in the site-specific project proposals.

27-10 The 50-foot buffer you refer to is for prescribed burn operations. Herbicide use in riparian areas referred to is primarily hand spraying, see page 1-10.

27-11 The EIS does not justify use of herbicides based on high organic matter content of soils. It does state that a wide variety of soil conditions are present and this variety will affect chemical persistence. Effects of different soil characteristics are addressed for each chemical in Appendix F. This information and soil survey information, and any changes to the soil resource will be utilized during site-specific project formulation and evaluations required before any vegetation management.

27-12 It is true that the chemical companies are usually not local but local firms may sell the herbicide and local flying services may do the spraying. Manual release workers will not necessarily be local as government contracts are circulated over a wide area.

27-13 See response 31-38.

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CCAP - California Coalition
for Alternatives to Pesticides
491 H Street, Suite C
Arcata, California 95521
(707) 822-8497

February 10, 1988

California State Director
Bureau of Land Management (932)
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

Dear Mr. Blakeslee:

Following are the comments from the California Coalition for Alternatives to Pesticides (CCAP) on your agency's Draft Environmental Impact Statement (DEIS) for the California Vegetation Management Program. CCAP is an organization of 36 member groups from the following northern California counties: Del Norte, Humboldt, Mendocino, Marin, Siskiyou, Trinity, Tehema, Butte, Lassen, Plumas, Yuba, Nevada, Shasta, Placer, Lake, Tuolumne, and Calaveras. We anticipate that some of our member groups will be submitting separate comments.

In general, CCAP finds the DEIS to be unclear, inadequately documented, and in violation of NEPA. The organization of the document breeds confusion, significant information is either missing or difficult to locate, and there is evidence of a persistent bias throughout in favor of the "preferred" alternative. The DEIS fails to adequately indicate the impacts which would result from the proposed action; such action, if completed, would constitute a major threat to public health and environmental welfare, and would be in contravention of the wishes of many directly affected persons. The DEIS should thus be reissued in a form and with a content that remedies these flaws.

Following are specific criticisms of the document.

28-1 **1) The DEIS fails to consider a full range of alternatives.** Only three alternatives are considered in any detail, and all three are predicated on one highly-specific general management plan, which requires the use of so-called "intensive" forest management techniques. No attempt has been made to consider alternatives based on less demanding timber harvesting regimes and/or on alternative harvesting techniques that may prelude the perceived need for the use of herbicides. The DEIS is thus in violation of 40 CFR 1502.14(a), (b), and (d).

28-2 **2) The DEIS fails to adequately describe the affected environment.** Of particular concern here is the failure of the BLM to describe, even in the most cursory fashion, the interface between people and the affected physical environment. Nowhere are we told how many people exist near potential spray areas, either as residents, tourists, water-users, or in some other relationship. Nowhere are the characteristics of any affected watersheds or air basins described in manner that informs either decisionmakers or the public as to possible herbicide distribution patterns and the resultant hazard posed to the affected public. The DEIS is thus in violation of 40 CFR 1502.15.

28-3 **3) The DEIS fails to accurately describe the environmental consequences of the proposed action.** The DEIS's section on environmental consequences is so superficial that it can only be assumed that the BLM intended for its "Human Health Risk Assessment", contained in an appendix, to provide the topic with the full coverage necessary. In the main body of the DEIS, for example, impacts on air and water quality are given less than four pages of coverage, total. There is no mention made of the effects of previous spraying on these resources, although there has been a history of oversprays, spills, violations of label requirements, and contamination through drift, volitilazation, runoff, etc. Such information would be much more helpful than the bland generalizatio contained in this section.

The "Risk Assessment" fails to improve on the dismal coverage of this topic. Th analysis takes incomplete, possibly inaccuate, and selected information, applies a prim tive methodology, and relates the results to a human and physical environment so ge eralized as to be meaningless. Among the most glaring deficiencies in this proce are:

a) the failure to fully list all of the data gaps for long-term health studi for the proposed herbicides.

b) the failure to describe and consider the effects of herbicides on sensiti populations, like children, the elderly, persons with allergies, etc.

c) the failure to adequately consider the cumulative effects of multiple exposur to herbicides and other toxins, especially the possibility of multiple herbicide appl cations in a particular watershed or air basin over time.

d) the failure to adequately account for synergistic effects, not just in t combining of two herbicides, but in the combining of inert ingredients, other additive and other toxins.

e) the failure to develop an adequate and accurate toxicity profile for iner and other additives, which may have hazardous effects on their own.

f) the failure to depict nay "real-life" situation that would combine all of t exposure and hazard elements that might be present in actual spray operations; t analysis is so abstract and hypothetical that the public and decisionmakers will doubt find it impossible to relate it to actual spray operations. What is needed he is the depiction of at least two or three extant areas that may face spraying, a which can then be related to the abstract data in the analysis.

g) the failure to make true "worst-case" assumptions for the basis of the "ri analysis". In a true worst case, herbicides would be depicted as having maxim toxic effect, the mechanisms of toxicity would be the most lethal, etc. Instead DEIS appendix gives us compromise positions on these factors and then attempts account for a "worst case" effect by plugging in a somewhat arbitrary "margin of sa ty", which may itself be a compromise determination. The document is thus dishon in its depiction of worst case risks, and should instead admit that current data a methodology are too limited to allow for an accurate depiction of true "worst ca situations and outcomes.

The DEIS is thus in violation of 40 CFR 1502.16(d), 1502.22(b), and 1502.24.

Thank you for your consideration of these comments.

Jerry Rohde

Jerry Rohde, for CCAP

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Response to Comment Letter 28

28-1 See response 26-1, in addition, the program is not based on one management plan but many land use plans, grazing EISs and timber harvest plans already done for specific areas. This EIS is thus tiered to those many plans to address herbicide impacts in one EIS instead of numerous EISs for each area. After this site-specific projects will be tiered to this EIS with site-specific EAs for each project.

28-2 Since specific treatment sites are not yet identified it is impossible to describe the public population characteristics except very generally. Due to the site-specific variation throughout California this is an issue to be addressed in the site-specific EAs.

28-3 It is possible there is a history of the occurrences you refer to, however no record of these occurrences on BLM lands in California exists. Nor is there any evident lasting impact to the landscape, water or wildlife on these BLM lands, similar to the insignificant level of impacts predicted in Chapter 3.

28-4 The methodology used is consistent with techniques used by agencies such as FDA and EPA. The assessment was prepared by qualified individuals and reviewed by others in the toxicological profession.

28-5 Data gaps are fully addressed on pages H-8 to H-11.

28-6 Page H-69 notes that the dose to a child might be 36 percent greater than the dose to an adult and H-122 notes that sensitivity cannot be predicted.

28-7 See response 26-14.

28-8 Herbicide mixes are addressed on H-116 to H-121. The toxicity of a formulation as compared to the pure herbicide is discussed on pages H-42 and H-43.

28-9 The inert issue is addressed on page H-41.

28-10 Doses received through multiple exposure routes are discussed on page H-75 and in Tables C-33 to C-143 margins of safety and cancer risks are presented.

28-11 It would be unrealistic to assign a toxicity greater than has been established for a herbicide, and then exposing a dose which is not foreseeable in a worst case situation. The scenarios are developed on the best data available and conservative assumptions not artificial information.

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10 February 1988

California State Director
Bureau of Land Management
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

Dear Sir,

Thank you for the prompt response in sending me the DEIS that I requested January 27th.

We have two pertinent interests in the proposed vegetation management programs on B.L.M. lands.

First: We have B.L.M. land adjacent to our 32 acre property on both our east and west boundaries. Our current water supply comes from a spring (from an old mine tunnel) fifty to seventy-five feet from the eastern line. We have a large herb garden approximately the same distance from the property line. The herbs, harvested for drying, are not washed. We are downhill from B.L.M. land in these areas on slopes of 10% to 35%.

Second: We spend much vacation time in the desert - exploring and camping, all the way from the Black Rock Desert to Death Valley, and therefore are very familiar with conditions there.

After reading the impact statement and carefully considering your proposed action, we must vote for Alternative 3 as the least destructive to our environment.

Our specific comments are as follows:

Consideration #1

Use of herbicides should not be considered. Much of the B.L.M. land in the foothills is contiguous with private property. Persons living in these rural areas - on property varying from lots to small and large acreages - , obtain their drinking water from springs and wells; have vegetable and fruit gardens; pick berries from along the roadside; raise animals for meat; hike, jog, and horseback ride; have dogs and cats. All of these activities would be at risk in sprayed areas.

BLE

Your report, (1-18) says -B.L.M. strives to keep land owners informed about its operations, etc.

Comment: Notices in local newspapers are missed most of the time. It was not until January 27, 1988 that I knew about the DEIS. Any neighbors I have spoken to are completely unaware of the report. Therefore, no one in this area has had the opportunity to comment or discuss these proposed operations and how they could affect this community.

Plans for lumbering off large trees on property of B.L.M. in this area (rural residential) are being implemented without informing the community or all of the adjacent property owners, even though there has been considerable controversy involved.

Your Alternative #3 leaves much to be desired if activities such as lumbering, burning, and bulldozing were to take place.

We are very vulnerable to erosion as much of the land is rugged with steep slopes.

Burning, even fairly distant from populated areas, would only add to what is already a serious problem.

4-51 Example: In October of 1986, U.S. Forestry, Lumber Companies, and Experimental areas(ie, Blodgett) all perceived a "window" on the same day. From 2 A.M. the next night , and for several days, a blanket of smoke hung over areas 20 to 30 miles away. Smoke conditions were worse than during large wild fires, as there was no air movement. The local (PLacerville) Air Pollution Control Board knew nothing of this, as these fires were over 3000' elevation and "were out of their jurisdiction". I cite this as the cumulative effect of several agencies "doing their thing".

Use of herbicides, burning, soil manipulation, would all have a deleterious effect on our wild flora and fauna.

29-1 Comment: Most, if not all, of the sensitive plants/ endangered species studies, were done in the desert areas. No concern was apparent or acknowledged for sensitive plants/ animals in the foothills and Sierras.

Consideration #2:

Our concerns with your plans for the desert result from our observations during the last twenty-five years or more.

We have come across barren places where vegetation was removed and grasses planted. In almost every case the grass is extremely short and sparse. Naturally, if irrigation is planned, oasises of green result, but that obviously is not your goal.

29-2 We are also concerned about plants to be eradicated. Surely, tamarisk is not nearly as invasive as willow which you would plant in its place (c-1). Willow becomes impenetrable after only a few years. Example: [Tule Canyon].

Young shoots of gorse and comfrey are forage for animals. Comfrey is also a valuable builder of compost for soil improvement.

We have always felt the desert has a fragile ecosystem better left alone.

SUMMARY

We realize that certain areas are affected differently then others in the broad territories you manage, and,obviously, with the work that was required to compile this DEIS report you must certainly aim to manage judiciously.

Our suggestions, hopes and prayers would be that the B.L.M would choose Alternative #3, but implement it with considered restraint to disrupt the desert as little as possible and minimize erosion by utilizing hand cutting, pulling, mowing and mulching practices. Putting the unemployed and C.C.C to work would help more men - than hiring one pilot to fly a helicopter.

In the rural residential areas of the foothills and Sierras, the interspersed B.L.M. land should remain pleasant woodlands; open space areas that will be appreciated as we become more urbanized. These woodlands would be equivilant to preserving small wilderness areas for the retired and other persons who would not be physically able to visit and enjoy the large wilderness areas.

We feel that selection of either Alternative #1 or #2 would create more problems than would be solved.

Sincerely,

Donald C. Gernes
Donald C. Gernes
Phyllis L. Gernes
Phyllis L. Gernes

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Response to Comment Letter 29

29-1 Appendix J addresses all T&E plant species and identified sensitive species. Many of the plants listed occur in the foothills of the Sierras. It is true that most of those listed may be desert species but that is related to the delicate nature of the desert, not that more studies have been done in the desert.

29-2 Tamarisk is an invading nonnative species while willow is native and wildlife of the desert utilize willow habitat more adequately while tamarisk is unsuited for native wildlife habitat.

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30

February 5, 1988
Star Route
Redway, CA 95560

California State Director
Bureau of Land Management
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

Dear Director;

I am writing you to register my strenuous objection to the spraying of herbicides for vegetation management in California.

Alternative 1 of the Draft Environmental Impact Statement con-
flicts with directives developed six years ago in consultation
30-1 with local (Northwestern California) residents and public interest
groups to reject the use of herbicides. Ten of the sixteen sub-
stances slated for use have been found by the California Depart-
ment of Agriculture to have harmful effects, like birth defects,
30-2 genetic mutations and cancer. The DEIS glosses over these
hazards, just as it downplays the risk of spray drift, water con-
tamination and catastrophic accidents (such as the U.S. Forest
Service accident in the 1980-83 period, when a helicopter jetti-
30-3 soned 250 gallons of 2,4-D and another herbicide into the Los
Padres National Forest). Your proposal also does not provide
for adequate notice to local communities of spraying, even though
30-4 the DEIS is not site-specific.

If commercial timber species need to be released, and perhaps they do, do it manually. Manual release is environmentally safe and employs local people.

I speak for the King Range and the Arcata Resouce Area in particular. We wish to protect these wild areas for the plants and animals that live in them, for the people who enjoy them now and profit in numerous ways from their existence, and for future generations. If you will not reject Alternative 1 of the DEIS forthwith, I insist you hold public hearings on the matter in the affected areas with all due speed.

Sincerely,
Denise Grover
Denise Grover

Response to Comment Letter 30

30-1 We are unsure of the agreement you refer to. The Timber Management Plan for STU-13 was done about 7 years ago and while not developing the allowable cut based on a need for herbicide use, the use of herbicides was still allowed for under the program.

30-2 Mutagenicity, fetotoxicity, and carcinogenicity are addressed by Appendix H.

30-3 See response 22-1.

30-4 See page 1-15.

31

Kristy Sarconi
Coordinator, Toxic Substances Committee of the
North Coast Greens
P.O. Box 284
Comptche, CA 95427

February 11, 1988

California State Director
Bureau of Land Management (932)
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

SUBJECT: COMMENTS ON THE DECEMBER 1987 DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR VEGETATION MANAGEMENT

Dear Mr. Blakeslee,

I have read the DEIS for Vegetation Management in California and am submitting comments on behalf of the Toxic Substances Committee of the North Coast Greens of Mendocino County.

In my reading of the document, I found that the information presented did not truly support the conclusion of the DEIS team that Alternative 1 should be the preferred alternative, although that seems to have been the goal. The flaws in this DEIS (such as lack of references for conclusions, inconsistencies, omissions, and incomplete analyses) weakened its credibility. This DEIS does not adequately discuss short-term and long-term, direct and indirect, and cumulative impacts for each of the alternatives. There is an inadequate discussion of the significance of incomplete or uncertain information in evaluating the impacts of the alternatives.

What I had hoped to read was a careful and thorough analysis that was prepared with scientific integrity. Such a document would have been closer to the spirit of the National Environmental Policy Act.

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I did not have time to comment on the toxicological sections of this document in detail. However, I am concerned about the inadequacy of the discussion in this DEIS of the environmental impacts of the proposed herbicides. Therefore, I would like to incorporate into my comments additional, highly relevant material:

> The Toxic Substances Commitee of the North Coast Greens incorporates herein, by reference, in their entirety, the following various inputs/comments to USFS and BLM EISs, DEISs, and WCAs which are on file at the regional offices of those agencies:
>
> NCAP "Comments for Scoping," BLM, Denver, 10/14/85
> NCAP "Comments on...FEIS," BLM, Portland, 2/3/86
> Ibid., 2/6/86
> CCAP "Comments for Scoping," BLM, Ssacramento, 4/25/86
> NCAP "Comments on...DEIS," BLM, W. Oregon, 5/2/86
> SAFE "Comments on Scoping," BLM Sacramento, 5/3/86,
> NCAP "Comments on Supp.DEIS," BLM, W. Oregon, 5/11/86
> Ibid. 6/12/86
> NCAP "Comments on Supp.," USFS R-5 San Francisco, 9/86

I respectfully request that the California State Office of the Bureau of Land Management rewrite this Draft Environmental Impact Statement for Vegetation Management, in order to produce a document which adequately addresses the environmental problems associated with the use of herbicides.

Sincerely,

Kristy Sarroni

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COMMENTS REGARDING BLM's DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR VEGETATION MANAGEMENT

1. Page 2-11:

31-1 There is inadequate information provided regarding the conflict between, on the one hand, the allowable cut set for BLM lands in California and BLM documents detailing the timber management program, and, on the other hand, the changes in the "land base as well as the timber stand structure" in Sustained Yield Unit 13." This needs to be addressed in this EIS, since the significance of the changes in the land base have not been addressed in the SYU 13 EIS and have a bearing on vegetation management.

31-2 Several statements are made about assumptions and estimates without including a reference to who has made them, and whether there is a rational basis for the statements. In the fifth paragraph, for example there are flaws of this type: "The allowable cut for BLM lands in California is presently 21.6 million board feet per year. *This level assumes that intensive forest vegetation management practices will be applied as needed.* [Who assumes? Where is the basis for the assumption detailed?] *Without intensive management the allowable cut would have to be reduced by an estimated 25 percent.* [Who says so? How is this 25% reduction determined?]...*It is estimated that the use of herbicides is the only viable method available to maintain 10 percent of the allowable cut.*" [Who estimates? How is this determined? This statement is too general to have value.]

31-3 Also, I don't understand the meaning of the sentence, "It is estimated that the use of herbicides is the only viable method available to maintain 10 percent of the allowable cut." The previous section of that paragraph suggests that the goal is to achieve 100% of the allowable cut, and that this requires intensive management practices--but achieving a level of 10% doesn't follow. There is some information missing which would connect this last sentence to the bulk of the paragraph. What do you mean?

2. Page 2-20

The "Economic Conditions" section states that BLM's "[v]egetation control activities generate employment and personal earnings in the local economy". A statewide total from BLM timber sales in 1987 is cited as $1,010,000, and $500,000 from grazing. It is then stated that this is "very significant to specific rural areas and the households supported by these activities on public lands".

31-4 I think you need to cite the specific rural areas which are supported by these activities and reference the determination that vegetation control on BLM lands is economically significant to an area.

The "Economic Conditions" section is also flawed because

there is no discussion of the impact of the herbicide moratorium
31-5 which has been in effect since 1984. In fact, the figures cited
on page 2-20, for 1987, are a product of BLM timberland and
rangeland management without herbicides. I would like to see a
factual discussion of the moratorium in terms of its economic
impact to specific areas. If, in this DEIS, the authors presume
that the use of the preferred alternative--using herbicides--
will improve "economic conditions" over the figures cited for
1987, then this needs to be backed-up with supporting evidence.

The economic impact of the change of land base, which has
caused a substantial decrease in the volume of productive
31-6 timberland, is not discussed here. Was the impact of this action
to areas and individuals taken into accourt?

3. Page 2-20, 2-21, and 2-22

The "Social Environment" section is also flawed.

It is too vague to say that a community is going to be
impacted by unemployment if BLM does not have an intensive veg.
31-7 management program. Get specific: what communities, how many jobs
are involved, what kind of jobs are these? As stated above, there
needs to be a comparison to the employment picture during the
years of the moratorium on herbicides.

I was surprised to read, in paragraph 2 of page 2-21, that
"[t]he full extent and intensity of the controversy among the
31-8 people of the EIS area are (sic) not known." Surely you are aware
that the Counties of Trinity and Mendocino had local ordinances
in effect from 1979-84 restricting the use of herbicides? And
that Mendocino County residents vehemently protested against the
Louisiana-Pacific Corp. when it resumed aerially spraying of
herbicides on timberland in 1985? You may not be able to verify
the sentiments of residents statewide but you should be able to
identify high-profile "anti-spray" regions or counties. I have
31-9 included a copy of a report I co-authored, A History and Analysis
of Herbicide Spraying on Timberlands in Mendocino County.
SeeChapter Four, (The Concerns of Citizens) and Chapter Five (The
History of Citizen Action).

I am also astounded at the statement, in the fourth paragraph
31-10 of page 2-21, that "[t]he agricultural use however does not
generate comparable opposition." Are you kidding? Lots of
attention has been focused on the inadequacies of the EPA and
CDFA registration process for pesticides. I refer you, for
starters, to GAO reports, and the work of National Coaltion
Against the Misuse of Pesticides, Natural Resources Defense
Council, and Northwest Coalition for Alternatives to Pesticides.
Within the state of California, there has been an incredible
amount of criticism of the agricultural use of pesticides. Look
at the work done by the United Farmworkers, CA Rural Legal
Assistance, the CA Action Network, Lawrie Mott of NRDC...look at
SB 950 and AB 2021...Raley's Market's independent testing for
pesticide residue!

There is an important objection raised by the public to the
use of herbicides on lands managed by BLM which is entirely

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omitted from the analysis of the controversy in this DEIS. I'm not the first to bring it up, so I'm bothered that it was not 31-11 included. It is this: there is a glaring lack of concrete data to support the claim that herbicides are more useful for vegetation management, or generate more jobs and improve economic conditions, etc., than other techniques available to BLM. This lack of data to justify the use of herbicides needs to be discussed forthrightly.

Many people would be very pleased to see BLM develop an environmentally-sound, non-toxic approach to vegetation management on public lands. It can be done. The California Department of Parks and Recreation, for example, is able to effectively control noxious weeds with no or minimal use of herbicides.

I am also disturbed by a statement made at the top of page 2-22, "[i]n some cases (especially concerning long-term effects), the scientific evidence may simply be inconclusive. Therefore, questions concerning the effects of using a particular chemical, though they appear to be scientific questions, *may have to be answered today* [who says so?] *in social and political terms. Conclusive scientific analyses may not be completed for years.*"

31-12 Page 4-3 lists the preparers of this document and none are political or social scientists. You are not qualified to interpret, on behalf of the public and in the public interest, inconclusive scientific information in terms of arbitrary social or political assumptions. If chronic effects are unknown, then say so and discuss the scientific significance of this, within the limits of your field of expertise.

Finally, I take great exception to the comments regarding the role of the public in the management of BLM land resources, discussed on page 2-22. We are in a public comment period, and before this there was a scoping comment period. Under the National Environmental Policy Act, federal agencies are supposed to actively solicit public comments. We, the public, are empowered by federal law to take a "legitimate interest" in how BLM land resources are managed. I find statements such as, "[a] traditional attitude of 'leaving resource management to the professionals,' and 'increasing numbers of people seem to want some say in how professionals do their job,' to be offensive and 31-13 biased. If it is professional for a hydrologist, soil scientist, forester, wildlife biologist, and range conservationist to render political and social decisions about the use of herbicides (see above), then it is a good thing that the public is exercising its right to examine the decision-making process!

> *NEPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and actions are taken. The information must be of high qualaity. Accurate scientific analysis,expert agency comments, and public scrutiny are essential to implementing NEPA...Ultimately, of course, it is not better documents but better decisions that count...The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment.*
>
> --NEPA 40 CFR, Part 1500.1

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4. Page 3-1

31-14 The discussion of the impact on air quality from chemical drift is inadequate on several counts. The way the information is presented suggests that, under some circumstances, drift of 200 micron-sized droplets can occur. But there is no discussion of the extent of drift (with possible impacts to people, wildlife, water, or non-target plants) with larger droplets. The discussion of the impact of drift from smaller droplets is inadequate because it does not consider the impact to wildlife, people, or water.

Information about drift is available from several sources; it is not necessary to rely solely on information presented at the CA Weed Conference in 1985. David Pimentel, for example, has researched and written about drift. The great concern on the part of the public regarding drift should compel the authors of this DEIS to thoroughly research the issue, and acknowledge conflicting information.

5. Page 3-2

31-15 The discussion of volatility is inadequate because it does not address any hazards except phytotoxicity. The impact to wildlife and people is omitted.

6. Page 3-2

31-16 The conclusion regarding air quality impacts from drift and volatilization is illogical.

It is not comforting to read that the impacts "are expected to be short term" when short term has been defined as a period of up to 10 years! And, as I mentioned above (#4), there is conflicting information about the extent of drift with 200 micron-sized droplets, so it is incorrect to assume that the impacts will be limited to the "localized area."

Also, two issues have been confused in this final paragraph. The period of time following a particular application of an herbicide during which drift and volatility will occur may be brief, but the duration of the impacts to people or the environment as a result of exposure to toxic chemicals in the air cannot be assumed to be brief.

7. Page 3-3

The paragraph, "Removal of solid stands of vegetation by chemical treatment may result in short-term, insignificant increases in surface erosion that would reduce as vegetation reoccupies the treated site" needs to be re-written. As it stands, it is not a meaningful statement.

31-17 "Removal" is not the proper word, since the vegetation is killed or suppressed by chemical treatment but not removed.

"Short-term" has been defined as a period of up to 10 years. The possibility of significant increases in erosion need to be evaluated.

Specify the type of vegetation which will reoccupy the site,

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and the duration of time before this vegetation will reduce
erosion. Identify and discuss the impacts on the rate of erosion
31-17 from other factors, such as soil type, slope, climate, and
aspect.

8. Page 3-3
Table 3-1 would be more useful if it listed the actual soil
types and summer soil moisture conditions found on BLM lands in
California. Are we, the readers, to assume that all BLM lands are
moist-fertile during the summer?
How persistent will these chemicals be under actual field
31-18 conditions? Just above the chart we are told, "Arid soils would
have longer herbicide persistence than other soils." There needs
to be a much more thorough analysis of persistence. The
statement, "the use of the 16 chemical herbicides under
Alternatives 1 and 2 would not degrade soil productivity when
used at approved application rates" is not supported by the DEIS.
Until the question of how persistent these chemicals can be on a
specific site is anwered, we can't predict the harmful effects on
desired plant species.
Also, this chart only lists active ingredients. But pesticide
31-19 formulations are applied, not just active ingredients. How
persistent are the other ingredients in the formulation?

9. Page 3-5
Regarding the detection of herbicides after applications of
herbicides: Mendocino County residents have long protested
self-monitoring for water contamination on the grounds that test
results are not credible. Since 1985, the North Coast Regional
Water Quality Control Board has had an agreement with the County
Dept. of Health to provide independent monitoring for all aerial
applications of herbicides. This agreement has not been called to
action yet, however, since no aerial spraying has occurred since
1985.

10. Page 3-6
The statement, "No herbicides applied on BLM-administered
lands have been reported to reach the groundwater" is
31-20 meaningless, since no chemical treatment on BLM lands has
occurred since 1984 but monitoring for groundwater contamination
in California under AB 2012 was not in effect in the early 1980s.
What we, the readers, want to know is whether any of the
proposed 16 active ingredients (or the other ingredients in each
formulation, or any metabolites) is capable of migrating through
soil to contaminate groundwater. The answer is yes! This DEIS
notes that 10 of the 16 are "relatively mobile" but it neglects
31-21 to mention that some of these active ingredient have already been
found in groundwater, including atrazine and amitrole.
I am disturbed by the conclusion that the use of these 16
herbicides will not significantly impact groundwater. Due to the
degree of concern among citizens about groundwater contami-

nation, BLM needs to take a hard look at each formulation when
evaluating the impact to water. Also, it is not enough to state
31-22 that "no significant impacts are expected"--who decides what is a
significant impact or a minimal impact? Define "significant!"

31-23 It is also important to identify in this document where sensitive areas are located within BLM lands and to list the site-specific factors which might contribute to leaching. It is not enough to state that (once this EIS has been approved) a site-specific analysis will be conducted for sensitive areas.

11. Page 3-7 and Page 3-14

31-24 The statement on page 3-7, "[t]he overall effect of managing competing vegetation would be to accelerate succession for forest management..." is conjecture since it lacks a reference.

The same is true of the statement of page 3-14, "[t]he overall impact of all alternatives would be to suppress competing vegetation. In a forest management context this means increasing conifer growth and survival." This needs to be referenced.

12. Page 3-9 and Page 3-12

The statement on page 3-9, "[c]hemical release would increase the growth rate of young conifer seedlings stressed by competing vegetation" is supported by a reference to a study in western Oregon. Let's see some studies about the growth rate of young conifers under field conditions found on BLM lands in California. If there aren't any, then say so. If you are going to use a study from Oregon, note the differences between growing conditions in Oregon and the proposed areas on BLM lands.

The discussion of manual treatments on page 3-12 is also irreparably flawed by references to studies in western Oregon. Let's discuss studies done in California on sites like those proposed for treatment by BLM. Do they exist? If they do, why are you citing Oregon studies? If they don't exist, then say so and admit that this creates uncertainty about the results of the proposed treatments.

I object to the use of the Oregon study (Roberts 1980) also because this DEIS does not state whether the resprouting species studied in Oregon are identical to those in California--this is critical! Or whether this study involved a comparison between manual treatment and herbicides--also critical, since the issue of efficacy is relevant to both.

This brings up an important question: what has BLM been doing for vegetation management in California since 1984, while the herbicide moratorium has been in effect? Let's hear about BLM's own experience with resprouting, and mulching, and scalping.

13. Page 3-14

The statement that "[h]erbicides would provide greater control of resprouting vegetation than other treatments, particularly when applied prior to burning" is bewildering on several counts. First, this is conjecture since it is not

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31-29 referenced. Let's see some comparative studies supporting this assumption. Secondly, why wasn't there a discussion of the impact from spray-and-burn operations in the section on air quality? (Review the written literature, including Roger Hart and J.C. Bentley before declaring that there is no impact.) This is the first mention of spray-and-burn treatment!

31-30 The statement that "[s]uppression of most competing vegetation through manual cutting would be temporary because sprouts would quickly regenerate, increasing brush density to above pretreatment levels" is also conjecture unless it can be supported with comparative studies regarding the efficacy of herbicides vs. manual cutting on species which occur on BLM lands in California.

14. Page 3-14

31-31 Please elaborate on the reasoning behind the need to apply herbicides to over 900 acres per year for the next ten years. The DEIS seems to imply that there has been no vegetation management in the last 30 years. Why not?

15. Page 3-16

31-32 I object to the statement that "[n]o direct toxic effects are expected from the use of any herbicides proposed for use" because the evaluation presented in Appendix L only refers to the active ingredients, not full formulations.

16. Page 3-19

31-33 State specific levels of contamination instead of saying, "no significant amount of herbicide is expected to reach streams", in order to make it clear what levels are considered significant by the authors of this DEIS.

Define what would be considered a significant effect, to make the statement "herbicides are not expected to significantly affect fish or their habitat" understandable.

31-34 On page 3-27 there is mention of "eight herbicides that showed positive or questionable responses in laboratory cancer studies." These eight chemicals are not specifically identified. There needs to be a discussion of California's Proposition 65 in respect to these eight active ingredients.

17. Page 3-20 and 3-21

31-35 The analysis of the impacts to wildlife, livestock and wild horses is incomplete since it does not incorporate information from studies which indicate that browsing/grazing animals are attracted to herbicide treated foliage.

18. Page 3-22

31-36 The discussion of the "Impacts to Economic Conditions" is flawed since certain direct costs of the use of herbicides

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31-36 (monitoring, training, insurance) are not included, which means that the comparision to other methods is distorted. Indirect costs are also ignored, but are important to consider. Economists Randall O'Toole and Jan Newton have both written extensively on this issue.

31-37 Also, cite the source of your figures, since I am aware of studies which show that the cost for aerial applications of herbicides versus manual release under field conditions in forested areas of California are in the same price range.

19. Page 3-24

I object to the statement here (which is similar to the discussion I objected to on pages 2-20 through 2-22) that "the gain or loss of 100 jobs scattered around the larger cities in the EIS area would not have significant social effects. In contrast, the concentration of those 100 jobs in two small towns with a combined work force of 500 would significantly affect social conditions in these towns." This statement is
31-38 meaningless, and deceptive. Cite actual examples of small towns with a combined total of 500 workers which will (not may) have 100 new jobs open up only by the implementation of the preferred alternative! What kind of jobs? Permanent Jobs? How many jobs has BLM provided in these towns while the moratorium has been effect?

I also object to the ridiculous suggestion that persons primarily feel threatened by the aerial applications of herbicides because they "associate helicopters with military activities." There are some concrete reasons to oppose the aerial applications of herbicides, but these are barely acknowledged in this DEIS. Please see A History and Analysis of Herbicide Spraying on Timberlands in Mendocino County. Chapter 4, "The Concerns of Citizens."

31-39 20. Page 3-28

The discussion of synergistic effects is inadequate. The statement that "(s)ynergistic effects are not likely to occur since synergism rarely occurs with chemical mixtures" needs to be referenced. It is not clear from the brief and incomplete discussion presented here whether synergism between active and inert ingredients in a single formulation or whether synergism between a formulation and other synthetic chemicals in the environment have been evaluated.

On pages 3-38 and 3-39 there is a discussion of synergistic effects which further confuses the issue. The statement that "(b)ased on the limited amount of data available on pesticide combinations, it is possible but very unlikely that synergistic effects could occur as a result of exposure to two or more of the herbicides" needs to be referenced, and is troubling because a conclusion is drawn in spite of insufficient information. The degree of uncertainty needs to be stated forthrighly.

Lack of data about synergistic effects is further noted on page 3-39: "The toxic effects of many of the possible herbicide combinations have not been studied. The first priority in

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31-39 toxicity testing is to study the effects of the herbicides individually, and this type of information is not yet sufficient in some cases." [Be specific--which active or inert ingredients are in this category?] "Moreover, the combinations that could be studied are too numerous to be examined." [Is the public expected to assume undefined risks from synergistic exposures because there is such a plethera of herbicides in use that the interactions can't be calculated? What a preposterous idea!] "The combinations of interest include not only combinations of two or more of the 16 herbicides, but also combinations of the herbicides with other chemicals, such as insecticides in the environment. [I agree, and I wonder why this was omitted from the discussion of cumulative effects on page 3-28.]

In light of the degree of concern expressed by citizens about synergistic effects, BLM needs to more thoroughly assess the factors which could favor synergism and also acknowledge areas of uncertainty about the impacts.

21. Page 3-28

31-40 The discussion of cumulative effects is inadequate because there is no assessment of the impact from herbicides to individuals within the context of real life exposures to toxics. A forest worker, for example, may repeatedly be exposed to small doses of forest herbicides while at work, benzene fumes while pumping gas at a self-serve gas station, indoor air pollution at home, and trihalomethanes while drinking coffee made with chlorinated water. There needs to be a discussion of simultaneous exposures to several chemicals from diverse sources in order to adequately assess cumulative impact.

The further discussion of cumulative effects on page 3-39 is also inadequate for the same reason, and is bewilderingly in conflict with the information presented on page 3-38 and 3-39 regarding the uncertainties of synergistic effects.

- There is also an inadequate discussion of the impact of cumulative effect to individuals with heightened sensitivity to herbicides.

22. Page 3-30

"The worker dose estimates were derived from actual worker field study data of 2,4-D doses found by urine analysis." This study, although not referenced, is probably the Lavy study, which 31-41 has been critically commented upon in other public comments on EISs for veg. management.

23. Page 3-33

It is inaccurate to state that "16 proposed herbicides" have been evaluated for public risks from routine-realistic doses because only the active ingredients in the formulations are 31-42 acknowledged. (And "Table H-25" is a misleading description of where to find the table.)

"The routine-worst case scenarios estimate the highest likely

31-43 public exposure levels from routine herbicide applications in the Pacific Northwest." Cite the source. Who made the estimation? Are the exposure levels planned for BLM lands in California identical to exposure levels in the Pacific Northwest? If not, cite the differences. I also object to the use of this information for a routine-worst case analysis because routine herbicide applications involvefull formulations, but only active ingredients have been included here.

24. Page A-3

31-44 The statement that "[t]he scope of this EIS is to evaluate alternatives for vegetation control which can be utilized to meet the land use decisions previously made through BLM's planning process" is misleading. It is important for this EIS to note that because of changes in the land use base, there are BLM lands which have not been included in evaluations which led to previous land use decisions, and these areas may not be apply to meet productivity levels set by those decisions.

31-45 Also, the documents referred to as the land use decisions need to be referred to by name, and the date of publication.

25. Page H-7

31-46 The definition of cumulative risk, "in terms of lifetime exposures to a given herbicide" is incomplete. What is omitted is the cumulative risk of exposure to many toxic substances in an individual's environment.

31-47 Define "sensitive individuals."

26. Page H-8

31-48 Omissions in the list of uncertainties: toxicity of full formulations, cumulative effects in the context of toxic substances an individual may be exposed to on a daily basis, and synergistic effects between active and inert ingredients in a formulation.

27. Page H-10

31-49 I object to the conclusion that "the cost of filling the data gaps is considered exorbitant." There needs to be a discussion on a case-by-case basis for each of the 16 active ingredients proposed for use. Prioritize these chemicals in terms of estimated volume of use, and toxicity. Then evaluate the effort to fill data gaps for the chemicals which are going to be used the most. Evaluate the ability to substitute other chemicals with less data gaps for those chemicals with lots of data gaps that are planned to be used often.

31-50 Also, I disagree that it is going to make a big difference in the "implementation of the vegetation managment programs" to wait another two years to fill these data gaps! Document the assumption that a two-year delay is critical, especially in view of the fact that BLM has managed without herbicides since 1984.

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Response to Comment Letter 31

31-1 As is stated on page 1-1 this EIS addresses the vegetation control impacts of implementing decisions of the BLM's land use plans. Land use planning goes through a separate EIS process. This vegetation management EIS is tiered to those EISs and it is beyond the scope of this EIS to readdress issues of the land use plans. The presently occurring Arcata RMP will address the changes in land base you are concerned with.

31-2 The allowable cut figure is a result of the analysis done in the SYU-8, 13, and 15 EAs and EISs. In these plans the need for intensive management needed is discussed. The effect of intensive management on 25 percent of the cut is from data in these timber management plans. The need for herbicides is also discussed, however, there is always some professional judgment necessary in comparing the yields from different techniques.

31-3 The reference to herbicides maintaining 10 percent of the cut means that 90 percent of the cut could be maintained if herbicides were not used, however the statement has been deleted from the final version.

31-4 This relates to areas where BLM holdings provide an important portion of the local economic base, and has been clarified on page 2-21.

31-5 The moratorium on the use of herbicides has no effect on the present economics and discussion thereof in the EIS. This is because the inability to conduct chemical treatments does not immediately affect the timber harvests but would do so over time as those sale areas now requiring treatment reach their harvestable age. Grazing levels have not been changed either as a result of the moratorium.

31-6 Any change in land base would affect the volumes of all alternatives equally.

31-7 The pages referred to are a description of the affected environment, impact discussion is found in Chapter 3. Due to the site-specific nature of these impacts they can only be characterized as you request upon specific project formulation.

31-8 The statement has been changed to reflect that controversy varies widely within the State, with the North Coast area being strongly antiherbicide.

31-9 The report was not included with the comment letter.

31-10 That sentence has been deleted.

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31-11 The effectiveness of herbicides in controlling vegetation is thoroughly documented. The EIS does not claim more jobs would be created or economic conditions would be improved by using herbicides. What it does state is that existing jobs and economics resulting from public land uses, i.e., forestry and grazing, would be better maintained with the full range of vegetation control techniques available to BLM.

31-12 The list of preparers includes a statement regarding the source of the Human Health Risk Assessment which was done by a team of toxicologists, biologists and public administrators. Numerous other BLM and Forest Service personnel have reviewed the information in the EIS and provided input besides just those listed in the document.

31-13 The people you refer to have not rendered any decision and will not. The decision will be made by BLM management based on the Final EIS and the public comments.

31-14 The air quality discussion on pages 3-1 and 3-2 has been rewritten. The discussion focuses on smaller droplets because large droplets are not likely to drift. The effect of herbicide drift in air on wildlife, people, and water are addressed in other sections of the EIS.

31-15 The discussion does note that volatilization losses are insignificant for most of the herbicides. Without significant volatilization of the chemicals it is unlikely humans or animals would be impacted and correspondingly was not identified as a significant exposure route in either the human health or animal risk assessments.

31-16 Short-term could be up to 10 years but could also be as short as 1 day or even less. The impacts to air quality and humans or the environment are not confused. Air quality is addressed in this section while other environmental and human impacts are addressed in other portions of the document.

31-17 The word "removal" has been changed to "control," and as in 31-16 short-term also means a 1-, 2-, or 3-year period or less. As there is a wide variety of vegetation types in the EIS it would be nearly impossible to identify site reoccupation characteristics except on a site-specific basis as will be done in project EAs.

31-18 Not all BLM lands are to be treated with chemicals; only 6,900 acres out of 17.5 million acres managed by BLM would be sprayed in any one year. In most cases herbicides will be applied during the growing season when soils are moist. Due to the wide variety of factors affecting persistence, Table 3-1 is only presented to show relative persistence. Effects on specific sites and plants can only be determined later during specific project EAs.

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31-19 The table lists active ingredients however data used to develop the table involve actual monitoring of applied formulations. While other chemicals are contained in formulations it is still the herbicide active ingredient which is the object of major interest. See discussions regarding inert ingredients pages H-42 and H-43.

31-20 Monitoring initiated under AB 2012 was not the first time ground water was monitored for pesticides. BLM itself has sampled ground water as have other agencies previous to AB 2012.

31-21 The herbicides have not been found in ground water under or adjacent to BLM lands.

31-22 Significance firstly is dependent on the ability to measure effect and determining that it is attributable to a particular action. Secondly there must be an impact, such as in the case of water having the potential use of that water restricted due to hazard or cost to treat the water.

31-23 Due to the magnitude of BLM holdings it is inappropriate at this time to identify sensitive areas other than generally as has been done for areas near streams, steep slopes, wetlands, and areas with soils prone to leaching or erosion as addressed in Chapter 3. As D-1 outlines, pretreatment surveys and resulting EAs will address these issues on the site-by-site basis as is necessary and required.

31-24 The following references have been added to the Final EIS and support the statements on pages 3-7 and 3-14: Oliver 1982; Walstad et al. 1986; Dimock II 1983; and Sawyer et al. 1988.

31-25 Drawing artificial ecological boundaries between those forested lands administered by BLM and those not administered by the Bureau is meaningless. Oliver (1982) specifically addressed competitive relationships between brush species and ponderosa pine in California's North Coast range.

31-26 A detailed discussion of manual treatments is discussed and referenced in the draft Vegetative Management for Reforestation EIS, Region 5, USFS, on pages 64, 65, 67, and 68. Specific yield reductions due to competing plants are also referenced on pages 159-174. Some studies specific to California found in the FS EIS include McNeary 1983; Oliver 1979 (3 papers); Oliver and Powers (date); Oliver 1983; Roy 1956; Brun 1980; and Baron 1962.

31-27 The validity of using the Roberts (1980) study for comparative purposes in the DEIS is not contingent upon identical species composition occurring in western Oregon and northern California. Within the forest cover types the principal competing plants were grouped by expected similarity of competition, sensitivity, or by similarity of typical effective treatment methods.

31-28 BLM California has completed a total of 1,240 acres of land treatment/site preparation using manual, mechanical, and prescribed burning treatment for the period 1984-1987. In addition, 1,609 acres have been planted and 729 acres protected from rodent and animal damage. Precommercial thinning has occurred in an additional 1,132 acres.

31-29 Spray and burn is noted as the first line in Table 1-3 and detailed on C-1. An analysis of impacts from burning herbicide sprayed vegetation is contained and referred to on page 3-28.

31-30 This issue is covered by response 31-26.

31-31 It is not stated that no vegetation management has been done, it says there is a backlog due to past emphasis on harvesting and a lesser emphasis on reforestation, release, thinning, etc. In addition, cut over commercial forest lands have been acquired in some areas, many of these acquisitions require treatment.

31-32 Many of the studies referenced analyzed formulated herbicides not just the technical herbicide.

31-33 See response 31-22.

31-34 The eight suspected carcinogens are listed on page 3-33. A statement regarding Proposition 65 has been added to page 1-18.

31-35 This is a possibility, however based on the analysis in Appendix L effects on large species are not expected. As is stated in Appendix L smaller animals such as toads, snakes, and birds are more likely to be impacted.

31-36 Indirect costs for all techniques are ignored. Monitoring, training, and contract supervision must be undertaken whichever technique is used.

31-37 The costs on page E-1 have been revised and are also documented.

31-38 Since the discussion was only an example it has been reworded to better reflect its application to the document.

31-39 Synergism and the availability of information or lack thereof was addressed on pages H-116 to H-121.

31-40 These issues are a summary of the discussion on H-121 to H-122. The main reason for the identified insignificance of this issue is the small exposures identified in the overall risk assessment.

31-41 The Lavy study was used (and is documented in Appendix H) based on the preparation of the Human Health Risk Assessment by qualified toxicologists and a peer review. The study also fits the scenario likely under the proposed program.

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31-42 The relationship on toxicity, etc., between an active ingredient and the formulated herbicide is found on H-42 and 43. Table H-25 is an accurate description of where to find the MOS data. Examination of the narrative next to Table H-25 will refer the reader to more specific data in Attachment C.

31-43 This editorial error has been corrected to California. It is true that in the scenario used exposures would be the same in both areas if the amount of active ingredient used was the same.

31-44 When new acquisitions are made by BLM they will be incorporated into BLM land use plans through amendments or updates as in the case of the present Arcata RMP process.

31-45 See response 20-2.

31-46 That is not the definition but is the manner in which cumulative risk was addressed.

31-47 Sensitive individuals are discussed on page H-121 and H-122.

31-48 These uncertainties have all been addressed at some point in Appendix H.

31-49 With BLM's relatively small use of the large volume of these chemicals sold each year it would be exorbitant for BLM to provide for these studies, especially with EPA requiring the manufacturers to provide much of the information. The analysis done in the EIS satisfies the requirements of NEPA.

31-50 The initial four years of the moratorium has been handled without severe hardship. However, any additional delay may result in changes in timber yields in the future. In addition, treatments deferred in the hope of future action will likely cost more to implement later.

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JACKSON VALLEY WATERSHED COALITION
PO BOX 221 BRANSCOMB CA 95417

February 12, 1988

California State Director
Bureau of Land Management (932)
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA. 95825

Public Servants,

The following is a comment on the Draft Environmental Impact Statement (DEIS) for the California Vegetation Management program.

The studies presented in the DEIS are single organism risk assessments. There are no studies which track the behavior of chemicals in the ecosystem as a whole. Especially, response data on communities of organisms. The information needed for an adequate understanding of the effects of herbicides in the forest relates to ecosystem assessment at watershed level.

32-1 Indirect effects of chemicals go largely unaddressed in the subject DEIS. Ecological realism is needed when testing toxic effects and can only be attained when test conditions reflect important characteristics of the natural environment. Single-species testing does not delineate the complexity of the structure and function of the ecosystem. In short they lack realism. To study the effects on fish, for example, and not the effect of the fish on its predators when consumed is insufficient when addressing the true effects of chemical toxicity.

32-2 How do these chemicals behave in nature? This is the question which needs to be addressed by this DEIS. Do the chemicals bind to the soil? How and by what are they assimilated? How do they effect the food chain? It does little good to know the resistance of rats or fish if their main sustenance is no longer available as a nutrient because of an adverse reaction to a specific chemical application.

Single-species testing is still needed, but testing should also be modified to include ecosystem and pollutant realism. There should also be:

1. Survivorship curves and changes in population gene pools, migratory behavior patterns, and food preference studies.
2. Multi-species tests to include interactions such as: competion, symbiosis, parasitism, host-plant relationships, and predator-prey interaction.

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3. Ecosystem tests e.g. laboratory microcosms, greenhouse studies, field enclosures and field tests in natural ecosystems.

4. Models - Both empirical and simulation models are needed.

Such an integrated system of testing would produce data on:

1. The characteristics of the chemical and its behavior in the environment.

2. The physiological responses of species related to the presence of the chemical..

3. Changes in species interaction.

4. Changes in the functional processes of the ecosystem (like mineralization; and nutrient, soil, water, and energy fluxes).

Until steps have been taken to gather ecotoxicological data and an assessment of the risks is developed which spans the entire ecosystem the scientific relevancy of the current DEIS studies are suspect. The DEIS as currently presented does not supply adequate data to allow scientific conclusions to be drawn relevant to their complete possible impact on a given ecosystem. 32-3

In this case a little knowledge may well prove to be an ecological disaster.

Sincerely,

Donald Cameron
Member, Jackson Valley
Watershed Coalition

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Response to Comment Letter 32

32-1 It is assumed indirect effects refer to bioaccumulation in the food chain. The discussion in Appendix F identifies that the herbicides do not bioaccumulate and also discusses the specific degradation and breakdown processes.

32-2 See Appendix F.

32-3 The DEIS has noted the scientific data gaps and uncertainties as required by NEPA under 40 CFR 1502.22 for such instances of inadequate data.

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SIERRA CLUB
Redwood Chapter
North Group
POST OFFICE BOX 238
ARCATA, CALIFORNIA 95521

February 10, 1988

California State Director
Bureau of Land Management (932)
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

Dear Sir:

The following comments on the California Vegetation Management DEIS are submitted on behalf of the North Group's Executive Committee. They deal primarily with timber management on the Ukiah District.

In our scoping comments of April 25, 1986, we stressed that BLM must provide documentation to support its statements on the benefits of vegetation management and the impacts of no vegetation management. To assume that without vegetation management, there will be reduced timber production is not adequate
33-1 to satisfy the requirements of NEPA, which call for a "scientific and analytic basis for the comparisons" of alternatives (40 CFR §1502.6). In the summary of impacts by alternatives (p. 1-13, DEIS), timber sales are predicted to decline from 21.6 MMBF under the preferred alternative, which provides for site preparation on 700 acres and release on 1,000 acres of timber land yearly, (p. 2-12) to 17.3 MMBF under Alternative 3, which prohibits herbicide use. The DEIS further states that "(i)t is estimated
33-2 that the use of herbicides is the only viable method available to maintain 10 percent of the allowable cut" (p. 2-11).

The DEIS presents no documentation in supportof these statements. Furthermore, the comparative table (p. 1-13) indicates that the present allowable cut of 21.6 MMBF, which has been maintained without herbicides, can only be maintained in the future
33-3 by the use of herbicides as proposed in the preferred alternative. What is the basis for such a conclusion?

A 1981 Record of Decision by the Ukiah District Office adopted a Timber Management Program for Sustained Yield Unit 13. Under this program, the average annual allowable cut is 8.5 MMBF, almost 40% of the 21.6 MMBF produced annually on BLM lands throughout California. This production has been achieved without herbicides. In fact, SYU 13 prohibits aerial application of herbicides (p. A2-4, Draft Timber Management EIS, SYU 13, Sept. 1980). The Final Timber Management EIS for SYU 13 states:

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> An alternative providing for the extensive use of aerial applications of herbicides was rejected as an alternative for this 10-year period because it is economically unviable. The use of herbicides has not been a normal practice of the forest management program for SYU 13. Herbicide use on a limited scale is planned in the proposal. However, this use would not be obligated in the allowable cut computation. The proposal calls for a hand-applied herbicide release spray on 135 acres of conifer site presently suffering from grass competition (p. vii). (emphasis added)

SYU 13 remains in effect in the Ukiah District and Area
Resource Management Plans reflect the policies and direction of
that document. The preferred alternative proposed in the DEIS
calls for aerial application of herbicides and predicts that with-
out that use there will be a reduction in the allowable cut. SYU
13 does not support that proposal nor the contention that aerial
herbicide use is necessary to maintain its present timber produc-
tion. The final California Vegetation Management EIS should in-
33-4 clude 1) documentation to support the statements that the present
allowable cut of 21.6 MMBF will decrease to 17.3 MMBF unless
herbicides are used and 2) the process which allows the California
33-5 Vegetation Management program to override SYU 13's prohibition of
aerial application of herbicides.

While there may be a future decrease in timber production on
the Ukiah District, it will not result from continuing the non-
herbicide use policy. Withdrawal of lands from the timber base to
protect other values, land exchanges, and in-lieu entitlements to
the State may reduce the timber-producing capability of the District
If this is the case, the allowable cut in the final EIS should re-
33-6 flect this reduced capability; a decrease in the allowable cut should
not be attributed to prohibited herbicide use.

The DEIS does not provide an objective assessment of the impacts
of vegetation management on wildlife. For example, it states that
the reduction or elimination of big sagebrush on 3,000 acres per
year would have "mixed" impacts on wildlife, indicating that while
loss of cover and some forage species would be negative, deer and
33-7 antelope would benefit from improved grass and forb composition (p.
3-16). Wildlife, including small, non-game species, which are
indigenous to the sagebrush habitat, do not need vegetation manage-
ment; non-indigenous livestock, do. The effects of converting
naturally-occurring habitat types to grazing lands and the effects
of displacement by livestock are not adequately discussed in the DEIS

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We urge BLM to substitute good land management for vegetation management. Selective logging, long rotations, acceptance of the role of pioneer species, and all-species/all-age forestry preclude any "need" for vegetation management. Control of livestock to prevent overgrazing and weed infestation and management for native vegetation types and wildlife should be the focus of BLM's grazing policies. Where introduced exotics are competing with native vegetation, site-specific measures for control could be appropriate, but wholesale elimination of vegetation communities, such as sagebrush, has no ecological basis. The intent of prescribed burning should be replication of natural fire events, not commodity production.

Thank you for the opportunity to comment.

Sincerely yours,

Susie Van Kirk
Susie Van Kirk

For the Executive Committee

Response to Comment Letter 33

33-1 Data on impacts is a direct result of the forest management documents for SYU-8, SYU-13, and SYU-15 now documented in both the affected environment and environmental consequence sections.

33-2 This statement has been deleted.

33-3 The need for intensive management affects future yields, without herbicide use productivity will decrease and the allowable cut would have to be recalculated based on the lower productivity in order to provide for sustained yields rather than over cutting.

33-4 Based on information in the SYU-15 document it is estimated use of herbicides affects 8 percent of the allowable cut, while in SYU-13 the land base has a higher amount of understocked lands due to brush encroachment and control of brush would increase yields 30-40 percent. Combining these estimates results in a 20 percent overall effect on the allowable cut.

33-5 This DEIS cannot and does not override any prohibition of herbicides that may result from any BLM planning document. As the SYU-13 allocations are being updated in the Arcata MFP, the new document and any future amendments or updates would be the guiding land use allocation for that area.

33-6 If the allowable cut is reduced due to land base changes it will affect all alternatives equally.

33-7 The sagebrush habitat type has been significantly altered over the past 100 years. In many cases indigenous wildlife species will benefit from land treatments. The proposed action does not involve large-scale conversion of naturally occurring habitat types to grazing lands. Treatment of sagebrush lands will merely increase their productivity for a variety of animals.

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RURAL INSTITUTE
ENVIRONMENTAL DEFENSE NETWORK

February 12, 1988

California State Director
Bureau of Land Management (932)
c/O Mark Blakeslee
2800 Cottage Way
Sacramento, Ca. 95825

Dear Director Hastey,

After reviewing the DEIS for BLM's California Vegetation Management program, we were shocked and disgusted at BLM's "Hastey" decision to resume chemical warfare on our public lands. This is a particularly ill-advised decision in California since the citizens of this state sent an overwhelming message to the Agro-Chemical Empire via Proposition 65 that we will not tolerate the further toxification of our environment.

The DEIS does not adequately advise decision makers of all the possible environmental impacts of herbicide use on BLM lands in California and Nevada, and therefore fails to adequately justify the decision to adopt
Alternative 1. In addition, the DEIS fails, as required by law, to
34-1 consider a full range of alternatives including a "no vegetation management"
alternative.

Under FLPMA, BLM must manage public lands according to the principles of multiple use and has a statutary duty to "prevent unnecessary degradation of the public lands". By waging an unnecessary chemical/mechanical war on so-called "undesirable vegetation", BLM has deliberately embarked on an "illegal" mission to permanently degrade and industrialize our public lands.

Vegetation management involves killing plants by chemical or mechanical means to reduce competition and allow desired plants to grow faster. This unnatural approach will result in the homogenization of diverse ecosystems and a permanent loss of critical wildlife habitat.

According to the DEIS (2-11,12), "Current BLM practices in California emphasize multiple use of forestlands. This decision as well as current stand structure allows cutting practices other than clearcutting in most cases...Cutting practices other than clearcutting tend to prevent invasion of sites by brush and therefore lessens the need for control of unwanted vegetation...The acreage that requires reforestation each year consists mostly of clearcut sites and areas burned by wildfire".

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34-2 The DEIS admits that all-age forest management would lessen the need for vegetation management, yet BLM deliberately embarks on a policy of even-age management for timber production areas: DEIS(2-12)-"Over many decades most of the forest lands that are allocated primarily to timber production in the EIS area would come under even-aged management".

The U.S. Forest Service has experimented successfully with alternatives
to herbicides. Salmonberry, for instance was found to be less of a problem
than had been earlier assumed. Pulling young ceanothus was cheaper than
using herbicides. Cutting alder at specific times of year nearly eliminated
34-3 resprouting. Yet, BLM has written off non-toxic alternatives as unfeasible.
BLM obviously has a bias in favor of herbicide use, and has become a
one-dimensional advocate of toxic land management.

BLM's socio-economic justifications for resuming chemical warfare are totally bogus. The DEIS(2-20) states that BLM received $72 million from public land activities in California in 1986 with the vast majority of that coming from mineral activities. Only $1,010,000 was taken in from timber sales, and a paltry $500,000 was realized from grazing receipts.

Yet BLM justifies uneconomical vegetation management activities in part because they provide employment to people who depend on a certain type of work (welfare ranchers? spray rig pilots?). This is inadequate justification for continuing management policies that are ecologically and economically inappropriate. The Reagan Administration, which bad-mouths "welfare cheats", says people should "vote with their feet" - go where the jobs are.

The DEIS(3-24) goes on to contradict the job rationale with the revealation that "None of the alternatives is expected to have significant social impacts resulting from employment changes associated with increase or decrease in forage or timber productivity".

The DEIS(3-22) claims that the "chemical peace" Alternative 3 would result in a $202,000 revenue shortfall from timber sales when compared with the favored "chemical war" Alternative 1. However, careful scrutiny of Economic Analysis Appendix 5 shows that Alternative 3 would actually bring in more revenue if livestock permitees were charged fair market rates for the forage they consume. In addition, with fair market rates for forage, BLM would not have to engage in the insane practice of converting vast areas to forage by "chaining, ripping, and chemical moonscaping"

34-4

Alternative 1 (chemical war) Total Cost	$930,500
Alternative 3 (chemical peace) Total Cost	$877,000
Alternative 1:Cost Differential	+$53,500
Alternative 3:Lost Revenue (timber sales)	-$202,000
Alternative 3: Net Revenue Loss	-$148,500

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Grazing Receipts 1986 (@ $1.35 per AUM = 370370 AUM)	$500,000
Grazing Receipts 1989 projected at fair market rates (@ $4.00 per AUM x 370370 AUM)	$1,481,480
Alternative 3: Net Revenue Gain ($1,481,480 - $500,000 - $148,500)	$832,980

34-4 The "chemical peace", fair market Alternative 3 would result in over $800,000 more revenue for the Treasury than "chemical war", business as usual Alternative 1.

34-5 In addition, the DEIS Economic Analysis does not include the indirect costs associated with the cumulative long-term effects of toxic chemicals on the environment.

The DEIS, therefore does not make a rational socio-economic justification for "chemical war" Alternative 1.

34-6 According to the DEIS(1-2): "As a result of scoping, the greatest amount of public concern is centered on the potential hazard of herbicides on the environment and human health", yet BLM arrogantly dismisses this concern as insignificant and contrives data and rationalizations to back up the premise that the herbicides considered for use are totally safe. BLM'S assumptions are erroneous because:

34-7 DEIS assumes that EPA registration is adequate proof of safety. EPA has relied on "trade secret" information from chemical companies which is of doubtful validity due to widespread fraud, outdated or nonexistent research and lack of independent review. EPA registrations are conditional at best and are based not on safety but on risk/benefit analyses which assume that a dollar amount of "benefit" is worth the immeasurable risk of cancers, birth defects, deaths, etc., that a chemical might cause. This is unacceptable. BLM has abdicated its responsibility to the public.

34-8 DEIS omits the impacts of chemicals listed as "inert ingredients" in the herbicides to be introduced into the environment. Many of the chemicals listed as "inert ingredients" are more toxic than the active ingredients.

34-9 DEIS does not include an adequate description of the affected environment. Do you assume the affected environment to be unpolluted to begin with? If so, you have failed to provide important information about possible impacts of the program upon existing toxic exposure because the levels of toxins people will be exposed to is vastly understated. Each of us is bioaccumulating an increasing body burden of toxic chemicals as a result of daily exposure to modern techno-industrial life.

34-10 DEIS does not include an adequate mitigation plan describing effective measures to minimize harmful impacts of the program if anything goes wrong (or right).

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34-11 DEIS assessment of impacts is not "site specific". It is too general and does not describe impacts in the particular local environments affected.

34-12 DEIS use of (NOEL) NO OBSERVABLE EFFECT LEVEL rather than (NEL) NO EFFECT LEVEL is an unacceptable variant of the old myth that what you don't see doesn't happen.

34-13 DEIS presents many uncertainties about silvicultural effectiveness and toxicity of herbicides. Describe the relevance of these uncertainties to their possible effects (worst case analysis: dead trees, dead animals, dead people).

34-14 DEIS fails to analyze previously sprayed areas for long-term effects, especially on "non-target" plants and animals, endangered species, etc.

34-15 DEIS fails to describe and consider the beneficial effects of other plants in the tree plantations (nitrogen fixation, shade, shelter, slope stabilization, etc.)

34-16 DEIS fails to analyze the effects on local employment of manual release vs. aerial spray.

34-17 DEIS fails to consider implementation guidelines to ensure that individuals exposed to toxic chemicals do so only at their own "informed consent".

34-18 DEIS fails to consider the establishment of Toxic-Free Zones surrounding anadromous fish spawning beds, important wildlife habitat, and all residences

34-19 DEIS fails to analyze the historical records of each Land Resource Region regarding the assumptions made about the efficacy and costs of different treatments.

The DEIS has contrived an exhaustively complex "Risk Assessment" consisting of Hazard, Exposure, and Risk Analyses which allow BLM to arrive at the pre-conceived conclusion that the herbicides scheduled for use will not have a significantly adverse effect on the environment.

The Risk Assessment makes the following worst case assumptions:

34-20 1. All herbicides cause cancer (some more than others)

34-21 2. Populations adjacent to BLM lands will be exposed (some more than others)

34-22 3. One or more of the general public will be exposed (some more than others)

34-23 4. Workers will be exposed (some more than others)

34-24 5. Wildlife and domestic livestock will be exposed (some more than others)

Yet the BLM determines that the above risks do not outweigh the so-called benefits, so chemical warfare is deemed appropriate for the BLM mission.

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34-25 The DEIS is packed with carefully deceptive statements, misinformation and downright lies. For instance, the DEIS(3-4) claims that "no herbicides applied on BLM administered lands have been reported to reach the groundwater". What tests were conducted to prove this ?

The DEIS(3-16) claims "No direct toxic effects are expected from the use of any of the herbicides proposed for use...the risk assessment found that risks to wildlife from chemicals would be low to negligible, with no likely effects to larger animals". (3-17) "Exposure to acutely toxic levels of herbicides is not anticipated...Chronic effects of herbicides on wildlife are not anticipated". (3-19) "The possibility exists for herbicides to enter streams through either accidental, direct application, drift, or movement of chemical residues from upland areas. If chemicals are introduced to streams, any exposure to fish would likely be of short duration. Herbicides are not expected to significantly affect fish or their habitat under any alternative".

34-26 The above statements are totally false according to recent research published in the November, 1987 issue of Environmental Toxicology and Chemistry (see enclosure). The study conducted by a diverse, reputable group of ten researchers reports the results of an experiment with rainbow trout utilizing the lowest dose of TCDD ever tested (38 parts per quadrillion - ppq). As a result of the study, researchers estimate that rainbow trout bioconcentrate TCDD in their bodies 39000 times over the TCDD levels found in their acquatic environment. The inescapable conclusion is that TCDD may cause damage at all doses. TCDD is capable of killing organisms at extraordinarily small doses, and it is killing organisms at those doses. BLM proposes massive aerial application of 2,4-D. An internationally respected German analytical chemist, Hanspaul Hagenmaier, has found a German sample of the phenoxy herbicide, 2,4-D, to contain 6.8 parts per billion TCDD. The BLM should include up-to-date data in The final EIS.

The DEIS(3-27) makes the following claims: "Risks to the public of systemic or reproductive toxic effects from routine spraying operations are very low for all 16 of the proposed herbicides...Cancer risks for the proposed herbicides are low...There appears to be little risk that herbicides would cause heritable genetic mutations...No human studies are available that associate any of the herbicides with heritable mutations".

34-27 The above statements are totally false according to recent research (see enclosure) conducted by a ranking Veterans Administration doctor in Oklahoma City. The first-of-its-kind study by Doctor Johnny Roy shows that a high number of Vietnam Veterans exposed to Agent Orange have seriously damaged chromosomes. The VA is, understandably, trying to suppress this study, but the BLM as a fellow Federal co-conspirator should be able to acquire copies of this research, and include it in the final EIS - just for the hell of it. Doctor Roy's finished study will be an important milestone in the area of determining dioxin's influence on birth defects. We demand that BLM include this material in the final EIS.

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CONCLUSION:

BLM proposes to use herbicides assumed to cause cancer to manage vegetation that doesn't need to be managed because we do not live in a risk-free world, and the risk of giving a "few" humans and animals cancer is acceptable because of the benefits we will gain by industrializing diverse ecosystems for an influential handful of welfare ranchers and timber companies.

History has repeatedly shown that many "approved" herbicides and pesticides are eventually found to be as dangerous as other substances previously thought to be harmless. By then, it's too late for the suckers who've been exposed - "sorry about that". The BLM apparently doesn't give a damn though, since the Federal Government is immune from prosecution for damage caused by its actions (Supreme Court ruling that the Government could not be held liable for cancer deaths caused by nuclear testing in Nevada). Similarly, the Veteran's Administration won't recognize Agent Orange disabilities because the rest of the government doesn't. The treaty Richard Nixon signed gave reparations to Vietnam, so for the U.S. Government to recognize Agent Orange disabilities among American veterans, they would have to admit the effects on the Vietnamese. They would be held responsible for crimes against humanity.

BLM's resumption of chemical warfare against the Earth is, quite frankly, an outrage! BLM is asking the public to accept a perverted form of industrial triage. No chemical should be used on public land until it can be proven beyond a shadow of a doubt that it is safe.

We demand that BLM nullify the present DEIS for California Vegetation Management and submit a new DEIS based on current information and considering a full range of alternatives including "no vegetation management". An unbiased assessment based on ecological facts rather than contrived fiction will lead BLM to conclude that most vegetation management can be left to nature.

Sincerely,

Don Morris
Forest Watch Coordinator
The Rural Institute, Inc.
c/o P.O. Box 1551
Willits, Ca. 95490

encl.
cc: Kristy Sarconi
DCM: pds

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Response to Comment Letter 34

34-1 The NEPA requirement for a no action alternative includes the interpretation that no change can be a no action alternative when management will continue. The idea that no management would occur is unlikely since BLM land use plans have already made land use allocations through the NEPA process and no action was rejected at that time. Since this program is tiered to those land use plans no change satisfies the no action requirement. Alternative 3 is essentially a no change alternative as it proposes the control utilize techniques BLM is presently limited to.

34-2 The third paragraph, now on page 2-12, has been rewritten to better describe why even-age management would result.

34-3 Close examination of the proposed action shows that of the treatments proposed for silvicultural needs 820 acres will be treated by nonchemical means. This is 48 percent of the total silvicultural treatments. BLM feels the proposal is a balanced means to address program needs.

34-4 Your analysis is faulty in that you apply a higher forage rate to Alternative 3 and compare it to Alternative 1 at a lower forage rate. Such a comparison must use a similar forage cost. And in your comparison since AUMs are the same grazing fee return would be the same and not a factor in the comparison.

34-5 Since the EIS projects no significant cumulative effects identification of those indirect costs is not possible.

34-6 The concern for the hazard of herbicides is not dismissed as insignificant. Over one-half of the document is devoted to examining the hazards, exposures, doses, and possible effects of herbicides. The EIS does say impacts should be insignificant, but does not belittle the concerns for hazard.

34-7 BLM did not simply accept EPA registration as proof the herbicides are safe. Appendix H contains different application scenarios for each chemical showing the expected margins of safety for different possible affected persons. BLM managers in this way will be able to decide if use is too risky or acceptable in a given situation.

34-8 Inerts are addressed beginning on page H-41. Those herbicides with inerts of toxic concern will not be used (page 1-7).

34-9 The lack of a chemical-free environment is acknowledged on page H-121 and discussed in the Affected Environment discussion.

34-10 Appendix D discusses mitigations as well as identifies how pretreatment surveys will determine any site-specific mitigations required.

34-11 Page 1-15 identifies that this is a programmatic EIS. Tiered to this EIS will be site-specific evaluations of each and every project for vegetation control.

34-12 The use of the NOEL is widely accepted for toxicological analyses, both in practice and regulations.

34-13 Worst case analysis has been done for human health (Appendix H) and a risk assessment has been done for wildlife (Appendix L). As for the need for such an analysis on trees it is not deemed necessary as herbicide labels are very clear as to their effect on different vegetation (see C-2 to C-5).

34-14 Past sprayings by BLM show no long-term effects, many show no evidence of having been treated.

34-15 Use of herbicides does not kill all other plants in treated areas. Treatments mainly set competing species back and allow timber species to become established and grow at a faster rate. The beneficial aspects of other plants is recognized, however without some control of competition timber reestablishment would be delayed.

34-16 The EIS identifies no significant employment changes from any alternative.

34-17 Under Federal Regulations 29 CFR 1960.34(b) BLM must inform affected employees of hazards involved, protective measures to use, and how to use personal protective equipment.

34-18 The pretreatment surveys required before any project (herbicide or nonherbicide) would identify all necessary nonapplication zones required for water quality protection, plants or animals of concern and human safety zones.

34-19 The local BLM offices have the specific data for effectiveness and costs of treatments in their region. Since costs vary widely because of several factors this EIS has used average costs.

34-20 Only 8 herbicides of 16 are known or suspected carcinogens.

34-21 Populations may be exposed, not will be.

34-22 See above.

34-23 Yes, workers are the most likely people to be exposed.

34-24 Again there animals may be exposed, not necessarily will be.

34-25 While only a few widely scattered ground water quality analyses have been made for herbicides none have detected herbicides.

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34-26 That may be true, however domestic samples of 2,4-D have not been shown to be contaminated with 2,3,7,8-TCDD.

34-27 Again, you are referring to the effects of 2,3,7,8-TCDD which has not been found in samples of domestic 2,4-D.

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EPIC

Environmental Protection
Information Center, Inc.

x P.O. Box 397
[illegible]
Garberville, CA 95440
(707) 923-2931

California State Director
Bureau of Land Management
2800 Cottage Way
Sacramento, CA.
95825

Feburary 11, 1988

Dear Mr. Hastey,

The BLM proposal to spray 16 different toxic chemicals for vegetation management is inappropriate and unacceptable. The DEIS California Vegetation Management program does not reflect an exploration of all the reasonable alternatives. BLM has not proven the need for management with herbicides or fully revealed the impacts the program will have on rare and endangered plants and animals, air and water quality, fisheries, long term productivity of forestlands, primitive character of wilderness study areas(WSA) or the economic, social and health consequences to the greater community.

35-1 We believe that BLM has failed to recognize the substantial controversy surrounding the proposal to spray herbicides on public land and the significant impacts to the human and natural environment have been trivialized. This document has not been publicized by BLM, was released at Christmastime and is one of five different documents released effecting the Ukiah District, Arcata Resource Area by the Department of Interior. Altogether these documents measure a foot and a half thick full of technical data and overlapping planning documents.

35-2 For these and other compelling reasons, we request pursuant to 40 CFR 1506.6 that the public comment period be extended to include a public hearing on the DEIS.

35-3 It is not made clear how the vegetation management plan is tiered to existing and proposed planning documents. The draft Resource Management Plan for Arcata was released only a week ago and was driven by an active exchange program which resulted in a significant change in stand composition (2-11 DEIS/ VMP).

35-4 BLM claims to be following the parameters set in SYU 13 which prohibit the use of aerial herbicide application because it is "economically unviable" in the new Resource Management Plan (RMP) yet this DEIS states intensive management with the use of herbicides as the only viable method available to maintain the allowable cut. (DEIS 2-11)

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The DEIS (2-11) states that SYU 8 is the timber management
35-5 program for the King Range but the program was challenged by
the Natural Resources Defense Council so it is questionable
what document drives timber management in that vicinity. Most
timber stand improvement projects have been conducted under
other catagories ie. fuel reduction program in Mooning Creek
with a manual release and burning. The BLM just released the
FEIS on the King Range WSA which excludes the east side of
the area,unprotected and subject to intensive timber management.
The lack of site specific evaluation in the VMP/DEIS makes it
35-6 impossible to determine the impacts the proposal will have.

BLM fails to explore feasible alternatives to vegetation
35-7 management without explaining why.Prevention through utilization
of harvest methods which lessen the need for releasing trees and
recognition of the benefits to forest health and long term productivity
which natural sucession provides are not addressed.
These issues were raised in scoping but found to be beyond the
scope of the DEIS. Because the DEIS is programatic it is directing
land use for the next ten years and is proposing a management
35-8 program that will be incorporated into the existing framework of
land use on public land throughout California, failure to address
these issues is a violation of 40 CFR 1502.14.

While recognizing that various management systems are in
effect for BLM lands(2-11) and that some methods of harvest can
prevent invasion of sites by brush;BLM still maintains that intensive
treatment is the only viable method to reach the desired
allowable cut and even age stand compositon. BLM asserts that fast
growth, burning of slash,ever increasing dependance on chemical
inputs and a reduction in species diversity in favor of commercial
species is good forest management without explaining why all-age,
all-species management combined with labor intensive controls, thining
35-9 and site prep will cause a reduction in the long term sustained
-yield capacity for timber production.

The DEIS contains no thorough evaluation of the economic necessity
35-10 for herbicides and the unknown hidden costs in the long term.
Mannually cutting would temporarily reduce competition (3-12) and
herbicides would temporarily reduce competitors (3-8). The impact
of herbicides is greater on young sprouts and seedlings than on
full-crowned mature plants (3-9) whereas manual release techniques
35-11 would be effective in all types of vegetation and ages. The implications
of this difference is overlooked in the DEIS. Alternative 1
described on page 3-14 sheds an interesting angle on the situation
in areas like SYU 13 where increased application of herbicides is
projected "because treatments have not been current for at least
the last 30 years". Where in the DEIS has BLM evaluated the need
35-12 for repeated applications of herbicide due to these stand conditions
or the impacts to environmental and human health with "chronic"
need for applications to achieve even-age stands? Why should BLM
insist on increasing succession of pioneer species which may be
35-13 more beneficial to the long term sustainability of the forest and
rangelands soils than removal?

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The DEIS reflects a lack of understanding and respect for the
forest, range and brushlands as a complex interrelationship of
living organisms. While postualting that intensive management is
necessary to improve wildlife habitat, BLM fails to state that the
35-14 main benefactor would be deer herds, at the expense of endangered
species. The approach to grazing land is similarly skewed without
recognizing the impacts of overgrazing and it's relationship to the
exotic species taking hold. BLM implicitly directs the public to
35-15 accept the chemical treadmill necessary to gain economic benefit
from land taxed beyond it's natural carrying capacity. The references
to burning slash piles in the forest to reduce habitat for rodents
completely ignore the evidence that rodents, like voles, are crucial to
35-16 distrubiting the spore of the mycorrhizal fungi known to benefit
the forst through a symbiotic relationship by providing the conifirs
with minerals in exchange for photosynthesis.

Because of limited time; inconsistency with NEPA regulations, incongruities in the DEIS and missing information will be listed in the following pages:

PRESCRIBED BURNING

+ BLM admits (1-4) that herbicides combined with burning will create
35-17 hotter fire conditions yet estimates that 80% of forestland would be
lightly burned (3-7) The hotter fire is likely to spread faster,
damage released trees and soil. The BLM should have included case
studies such as release and burn programs occuring in the King Range.
The information in the DEIS on the prescribed burning which covers
the majority of the annual treatment is deficent. Please include by
reference the work of Dr. Jon Keeley USDA Forest Service, General
35-18 Technical Report WO-3, Nov. 1977 " Suffice it to say we do not know
what the natural pattern of fire is in chaparral. To even approach
this goal would require a large scale modeling effort".

+The BLM lists that benefits to burning the landscape is an in-
35-19 crease in water yields!!! Where is the documentation that this is
a benefit outweighing the havoc created by burning?

+ BLM cites benefits to wildlife populations (CDF EIR 1981)(3-18)
due to prescribed burning, a document which is not availble for re-
view or summarized. Wildlife burns are planned for a 10 year cycle
35-20 (3-5) contrary to Keeley"s findings that there is atemporary
growth of herbaceous plants which is relatively short lived
and by the end of the fourth year shrubs commonly dominate the site.
(Terrestrial Vegetation of North America, Cambridge Press, Jon E.
Keeleyand Sterling C. Keeley) how can BLM justify burning for wild-
life benefits???

ENVIRONMENTAL CONSEQUENCES

+BLM proposes to use 16 different chemical herbicides relying on
industry labels and faulty EPA registration procedures. The health
35-21 risk assessment is based on the assumption that people will not be
exposed. The DEIS calls for use of herbicides in recreation areas,
on trails and wilderness Areas under study with a public notice of

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two weeks after spraying. Many of the chemicals are persistent in the environment,soluable and will leach into water supplies and strea Some are proven to be toxic to fish, yet the DEIS claims that as a whole the herbicides will pose no significant environmental threat.

+ The buffer zones are inadequate and the issue of run-off in areas
of high rainfall is not even addressed. The DEIS refers to the state
35-22 mandated guidlines for buffer zones (1-10) but does not summerize
them or put in the appendix. This is missing information since it is
used to protect wetlands and streams.

+
There are numerous Data gaps in the health risk assessment. Over-
all BLM has underestimated the effects of full pesticide information.
35-23 The cost of the studies is to prohibitive (H-8-9) to determine the
real effects then they should not be used at all. How much are the
chemical companies profits ? Where will the toxic waste be dumped
which is the by product of the program?

+ The DEIS incorporates by reference the DEA's EIS for Cannibas
Eradication using Paraquat without summarizing the program although
35-24 it implies that BLM will use this method to eradicate the weed from
BLM lands. This document is not available to the general public.

Bruce Taylor at Congressman Bosco's office said that comments
would be considered two weeks to a month after the Feb. 15th dealine.
35-25 Please give me written assurance that this would be possible for
sending additional comments, especially inconjunction with the newly
released RMPfor Arcata Planning Aaea.

I submit these comments on behalf of EPIC, Inc. We are dismayed with BLM 's failure to recognize and respond to the numerous and extensive testimony presented on these very same matters. We will incorporate be refrence the enclosed list of public input we feel is revelant to the issues raise in the DEIS.

Sincerely,
Cecelia Gregori
Cecelia Gregori
Officer and Board Member

cc. CCAP
Sierra Club North Group
Aristi Scarconi
Rep. Doug Bosco
Sen. Cranston
Sen. Wilson

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INPUTS

'The Participants incorporate herein, by reference, in their entirety, the following [documents], on file at CCAP :'

CCAP, *et al.*, R-5 VM DEIS/SUPP PUBLIC INPUT, 9/11/86 -

> 'Participants reiterate for the record the Public Input made as various and several groups, separately and in assorted combinations, incorporated herein by reference in their entirety, copies on file with the Regional Forester. Participants also hereby incorporate all their filings in the matter of the Vegetation Management Environmental Assessment Trinity National Forest Administrative Appeal and *S.A.F.E.*, *et al.*, *v. Peterson*, *et al.*,' copies on file at the Regional office.'
>
> II A (p 2)
>
> 'C. Participants incorporate herein by reference, in their entirety, the various INPUTS/COMMENTS to USFS/BLM EISs/DEISs/WCAs:
>
> NCAP 'Comments for Scoping', BLM, Denver, 10/14/85;
> NCAP 'Comments on ... FEIS', BLM, Portland, 2/3/86;
> *Ibid.*, 2/6/86
> CCAP Comments for scoping, BLM, Sacramento, 4/25/86;
> NCAP 'Comments on ... DEIS', BLM, W. Oregon, 5/2/86;
> SAFE Comments on scoping, BLM, Sacramento, 5/3/86;
> NCAP 'Comments on Supp. DEIS', BLM, W. Oregon, 5/11/86;
> *Ibid.*, 6/12/86;
> NCAP Comments on SUPP, USFS R-5, San Francisco, 9/86.'
>
> II C (p 11)
>
> 'A. Participants incorporate herein by reference, in its entirety, the Northwest Forest Workers Association/CCAP Comments on the SUPP (9/11/86) submitted under separate cover to Region 5.'
>
> III A (p 12)
>
> Comments on 5/22/86 Veg. Mngmnt DEIS, Dr. E.L. Ellis, 7/14/86.
>
> App. B

Other Inputs to R-5 VM DEIS/SUPP -

Ida Honorof, 9/10/86
Northcoast Environmental Center, Tim McKay, 9/8/86
Northwest Coalition for Alternatives to Pesticides, Norma Grier, Mary O'Brien, 9/9/86
Northwest Forest Workers Association, Jim Adams, 9/11/86
Salmon River Concerned Citizens, Kenoli Oleari, 8/7/86
Salmon River Concerned Citizens/CCAP, Kathy Hall, 9/10/86
Sierra Club, Redwood Chapter, North Group, Susie Van Kirk, 8/28/86
Trinity County, 8/12/86

Other Inputs -

CCAP, NCAP, others to R-6 VM DEIS (1988) FIND DATES/DETAILS
Any Inputs to other BLM DEISs (see CCAP)
Filings in any court cases (????)

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Response to Comment Letter 35

35-1 The EIS acknowledges the public controversy which has also been reworded for clarification. The document has been publicized as required by NEPA through the Federal Register and news releases. The commenter was included on the original mailing list for the EIS and received the EIS over 60 days before the end of the review period, which is only required to be 45 days.

35-2 It is unfortunate that several actions are affecting the Arcata Resource Area, but this is true of other areas in the State too. The comment period was not officially extended however letters received later were accepted. Hearings were not scheduled for the DEIS because it was felt testimony would not add significantly to what would be received in written comment letters. This is justified based on the lack of site-specific projects which could be addressed by local citizens. At this point the EIS is addressing a general program which covers a statewide area. Public meetings and hearings may be considered for individual projects as they are formulated in the future and/or as a part of the site-specific Environmental Assessments.

35-3 An explanation of tiering has been added on page 1-1.

35-4 This EIS covers other areas than just SYU-13. If the SYU-13 prohibition on aerial spraying is not specifically changed in land use plans for that area, then aerial spraying will not be done in the SYU-13 area. However other areas in the State have no specific prohibitions on aerial spraying.

35-5 The SYU-8 document does guide timber management in the King Range, we are aware of no NRDC challenge on the timber program.

35-6 The EIS addresses the overall impacts of a vegetation control program and site-specific issues will be addressed by site-specific EAs (page 1-15).

35-7 This issue was addressed on page A-3.

35-8 No, the EIS will not direct land use. Land use is directed by the BLM land use plans referred to on page 1-1. This EIS only addresses how vegetation control will be done to meet the land use objectives decided upon by the BLM land use plans.

35-9 It is identified that the main factor for declined yields under no herbicides is due to the inability to treat all areas needing treatment due to labor intensive methods costing more than is available under BLM funding.

35-10 See response 34-5.

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35-11 Timing of herbicide application, type of herbicide used, and application method affects what species will be controlled by sprays. Full-crowned species can be controlled without effects to sprouts and seedlings through these techniques and is addressed on pages 3-9 to 3-11 and on page 1-7.

35-12 Page 2-13 discusses what repeat treatments may be necessary. Impacts are found in Chapter 3.

35-13 BLM is not increasing succession of pioneer species.

35-14 Pages 3-18 to 3-22 note that control may benefit or adversely affect deer depending on the area (forest, chaparral, or range) treated. The same is true for nongame species, however due to special requirements for threatened and endangered, and sensitive species no impacts to these species of concern are expected.

35-15 In many cases the chemical treatments on rangeland are proposed to speed up healing from past over use. Often times management changes alone do not accomplish necessary improvement and vegetation control treatments are used to accelerate improvement.

35-16 All slash piles are not always removed, nor is slash always piled.

35-17 Page 1-4 does not say prescribed burns would be hotter after chemical control. It simply says that if herbicides were used and dead vegetation was not removed by prescribed burns, wildfires would burn even hotter. Prescribed burns can be conducted to provide light burns as page 3-9 discusses.

35-18 A great deal of information is available regarding the natural fire patterns in chaparral especially recurrence interval and effects. See Wright, Henry A. and Arthur W. Bailey. 1982. Fire Ecology, United States and Southern Canada. John Wiley and Sons.

35-19 Reference to Anderson et al. 1976 has been added.

35-20 The 10-year cycle for wildlife burns includes utilizing a mosaic of unburned and burned vegetation. Burning periodically promotes growth of herbaceous vegetation and succulent chaparral growth which can be used by wildlife. Shrubs may dominate the site after four years, however they will usually be much better wildlife habitat and forage than stands which become very woody and dense after 10 years. Copies of the Chaparral Management EIR can be reviewed in several BLM offices.

35-21 The EIS does not assume no exposure of chemicals to people, it does determine that exposures will be of very low doses and risk of consequences will also be very low.

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35-22 The EIS states that buffers will be developed based on the site-specific factors, chemical used, and application method. This is consistent with State of California guidelines as there are no required minimum buffers. Use of California's Drift Control Guidance and site factors will be followed to protect waters. This site-specific evaluation will also better protect high rainfall areas.

35-23 NEPA guidelines for inadequate information have been followed.

35-24 The California State Office has a copy of the EIS available for review.

35-25 See response 35-2.

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FEB 10TH 36
MENDOCINO
CALIFORNIA
95460

TO THE STATE DIRECTOR, BUREAU OF LAND MANAGEMENT

I AM APPALLED AT YOUR PROPOSALS TO SPRAY B.L.M. LAND IN HUMBOLT AND MENDOCINO COUNTIES. IT IS YOUR DUTY TO BE RESPONSIBLY MANAGING PUBLIC LANDS, IN THE INTEREST OF THE PUBLIC. NOTHING IN THIS PROPOSAL SERVES THE PUBLIC. HOW CAN YOU EVEN CONSIDER SPRAYING KNOWN CARCINOGENS AND MUTAGENS? THE USE OF 2,4-D IS TOTALLY UNACCEPTABLE.

AT THE BASIS OF YOUR PROPOSAL, TO SPRAY, ARE SOME SERIOUS FUNDAMENTAL
36-1 FLAWS; ONE BEING CONFLICTS AND OVERSIGHTS IN THE DEIS., LACK OF
SUFFICIENT CONCERNS FOR LONG RANGE IMPACTS ON ENDANGERED PLANT SPECIES,
36-2 WATER QUALITY AND OVERALL ECOLOGICAL BALANCE WITH IN THE FOREST LANDS,
AS WELL AS HARM TO BIRDLIFE AND OTHER CREATURES.

ALSO FLAWED IS THE BASIC APPROACH TO COMMERCE. IT WOULD SERVE THE
PUBLIC IN MUCH MORE HEALTHY AND PRODUCTIVE WAYS TO TAKE THIS OPPORTUNITY
36-3 TO CREATE MUCH NEEDED EMPLOYMENT, BY USE OF MANUAL METHODS, THAN BY
SUCH A SHORT SIGHTED ATEMPT TO POISON VAST AREAS OF PUBLIC LAND.

I ALSO OBJECT VERY MUCH TO THE LIMITED OPPORTUNITIES FOR PUBLIC
36-4 INPUT ON THE PLAN AND FIND IT TOTALLY IRRESPONSIBLE THAT YOU COULD CON-
CIEVE OF SPRAYING WITHOUT DUE PUBLIC NOTICE.

THIS WHOLE SITUATION COULD BE HANDLED IN A MUCH MORE CREATIVE MANNER. WHY ARE YOU SO WILLING TO USE THESE CHEMICALS KNOWN FOR GIVING DEATH AND DEFORMATION? YOU HAVE NO RIGHT TO POISON THE PUBLIC WITH OUR OWN PUBLIC FUNDS, RISKING IRREPARABLE DAMAGE TO THE ENVIRONMENT WHEN YOU COULD BE CREATING EMPLOYMENT POSSIBILITIES INSTEAD

SINCERELY,

BOX 765
MENDOCINO
CALIFORNIA
95460.

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Response to Comment Letter 36

36-1 Endangered plants are addressed with special procedures. See pages 1-5, 1-16, 2-9, and 3-15.

36-2 Water quality, vegetation, and wildlife impacts are found in Chapter 3 with additional information in Appendix L of effects on animals.

36-3 The alternatives addressed result in no significant changes in employment. Page 3-17 identifies that BLM funding for vegetation control is limited and that available funding will not allow conducting manual treatments on all acres needing control, thus significant changes in employment are not expected.

36-4 See responses 24-1 and 24-2.

37

Roger and Karen High
P.O. Box 663
Nevada City, CA 95959

February 12, 1988

California State Director
Bureau of Land Management (932)
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

37-1 The California Vegetation Management EIS statement fails to present a full range of alternatives. Consideration of a reduced spray program, eliminating 2,4-D, amitrole, diuron and fosamine, in addition to a ban on aerial spraying should have been considered.
37-2 Alternatives which strictly adhere to an Integrated Pest Management Program using chemicals only as a last resort should be developed.

As the document now stands, the only viable alternative is Alternative 3, no chemical management.

37-3 As the procedure now exists (A-3,1-2), the management decisions are being made in another process under timber management, chapparal management, etc. The cart is being put before the horse and the public monies are being spent in vegetation management which could have been eliminated if management actions were forced to consider the entire program.

37-4 Economic efficiency is not fully presented in this EIS. E-1 costs must include EIS preparation, litigation, accidents and training. Many high costs associated with use of herbicides are hidden in administrative overhead rather than specific to project designs.
37-5 The percent contribution of costs from counties and state, as well as volunteer help, should be given a cost figure.

37-6 That the supposed cost-benefit can be determined without (3-23) any information on range improvement is unacceptable. Assurance that a study is performed before implementing a specific project is not a valid procedure (3-41).

37-7 The EIS assumes that full budget and personnel will be avilable to implement each alternative on page 3-1 and then complains about the economic inefficiency of Alternative 2 (page 3-15) as well as the inability of actually funding Alternative 3 -- a full budget is doubtful!

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While economic assumptions are not documented in the EIS, an interestin game of logic is played when comparing conclusions regarding wildlife and conclusions re economics of communities.

Short-term, localized reductions in wildlife populations appear to be acceptable to BLM. The overall program is compared to the thousands of acres in the EIS area. Negative effects on wildlife are dismissed on that basis.

However, when considering the economics of management programs
which will have short-term, localized effects on unspecified areas
and individuals even though the program itself is an insignificant
part of the total proceeds from these programs within the EIS area
37-8 --BLM favors bolstering a false economy without economic justification
in the EIS for a small number of individuals. This is with public
funds. It is boondoggle decision-making and it is unacceptable.

Detailed comments on the text follow these comments.

Karen High

Roger and Karen High
P.O. Box 663
Nevada City, CA 95959

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37-9 "Noxious weeds have become established and are spreading on public lands. (1-1)" The question that must be answered is why this has happened. Are past poor range/timber practices responsible and have practices changed?

1-4 states that it is not possible to limit grazing to target 37-10 species, therefore, that alternative was eliminated. How successful is a chemical program in limiting effect to target species. Where are the figures on efficacy for this program?

37-11 1-10 buffer zones of 25/10 feet are unacceptable. Buffer zones should be 100 feet/100 year flood plain. There should be no management for timber in these zones. Range destruction of 37-12 water channels must be corrected. As stated on 2-16 2/3 of the total miles included in BLM lands are high quality anadromous fish habitat and no degradation should be chanced.

37-13 1-15 Monitoring parameters are too vague to be of value in a decision. Mitigation measures should be evaluated for all projects to determine if they are of any help. There is no sense in continuing to design projects which are failures.

37-14 1-16 What is the meaning of the statement that the FS "can later document the chemical hazard portion of this EIS?"

37-15 The document must assess the cummulative effects of proposed actions. Ignoring the proposed treatments of the FS and other public agencies is a violation of NEPA.

1-18 Notification of landowners before a spray project who reside within 1/2 miles is insufficient. Watershed is the word which this document ignores.
2-3 admits that ephemeral, intermittent and small perennial streams are abundant on BLM lands. Buffer zones must be used for these water sources in order "to protect and enhance water quality."

37-16 2-11 and 2-12 If "other than clearcutting tends to prevent invasion of sites" why go to even-aged management with its greater need for public support dollars?

37-17 2-17 It is difficult to believe that the spotted owl exists only in the Ukiah district. There is no map of BLM districts to compliment figure 2-1.

37-18 3-1 3-1 states that full funding is assumed to implement the selected alternative. How realistic is this? There is no information re budget requests and final funding. What balance among projects will be selected? The balance of range vs. wildlife habitat is an unanswered question.

37-19 3-2 That the burn program will not exceed air quality standards is an unsupported statement without historical record of past

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37-20 3-3 The discussion of soils ignored non-point water pollution
which is a major concern in Northern California. The herbicide
degradation rates are meaningless as it appears most applications
37-21 will be in arid soils (chapparal) not moist-fertile, temperate
climate. Table 3-1 is meaningless to the discussion.

3-4 Where is the support for the statement that long-term erosion
37-22 on prescribed burn areas would be more stable than as a result
of wildfires? What is the historical record of the achieved control
of burn intensity to support the conclusions re prescribed burns?

3-5 Efficacy of "normal BLM herbicide applications using standard
37-23 controls" is not in this document, therefore, impacts on surface
water are unsupported.

37-24 3-6 The beneficial impact of increased water yield is false as
only water which can be stored has any value.

"No herbicides applied on BLM-administered lands have been reported
to reach the groundwater." This statement is unsupported by
37-25 documentation. What percentage of BLM spray programs have monitored
groundwater?

3-7 Prescribed burns and forest management: the planners must also
consider pre-harvest burning in program design. Why are we treated
to a statistical statement of escaped slash burns and not for
37-26 rangeland, etc? The California figure means nothing without the
number of burns conducted over the last 10 years.

37-27 3-10 Where is the historical record to support the statement that
proper application procedures are avoiding non-target species?

3-11 Slash piles also provide excellent habitat for other animals
37-28 than rodents. Downed logs are also of concern to animal habitat
and are ignored in BLM programs.

3-12 If manual preparation and release reduces competition for
37-29 a short period, why is it not stated that chemical treatment is
of short duration as well?

3-17 As the majority of the spray program is aerial, non-target species elimination will destroy diversity. It is a edict of the EIS process to protect and enhance diversity as well as water quality. Aerial application is unacceptable.

3-19 The discussion of fish in this section points out the
shortsighted view this document presents. The cummulative impact
37-30 in watersheds is the prime consideration in any statements about
water quality/fish.

37-31 3-20 Wildlife Summary Because table 3-2 ignores the impacts of
prescribed burns the summary statements are not true. The cummul-
37-32 ative effects of management activities must be considered.
Effects on wildlife are dismissed as short-lived and localized.
Localized reductions in food supply and cover mean death (negative
37-33 effect) to wildlife. This appears to be acceptable to BLM.

though timber and grazing are "insignificant portion(s)(2-20)"
of activity when considering other agencies the localized, short-
term effect of reduction is unacceptable. BLM is required to
enhance diversity not support reduction of animal/plant species.
37-34 Economic support of communities is not to be used as a counter
argument. We support actions which enhance the wildlife/plant
communities not false economics.

37-35 The document ignores the negative side of "edge effects": the reduction of songbird populations due to the cowbird intrusions.

37-36 3-20/21 If herbicide applications preclude grazing for livestock -meat and dairy- how does Alternative 1 benefit lactating deer and antelope (3-16) if there is a danger to the health of fawns?

37-37 3-22 Signs notifying the public of herbicide application must be up longer than two weeks. Arid, poor soils will not aid in the degradation of the herbicides as stated before.

3-25 Posting for burn activities must also be done. Being "well aware of impending activities because several hours of preparation are required" is not a valid practice. Pre-testing for herbicide residue is a necessary monitoring activity.

37-38 3-27 Exaggeration of risk is questionable as low level studies are not done on the chemicals.

37-39 3-27 The paragraph of mutagenicity must be rewritten. The assays are specific; it is not a matter of negative reults in a majority of tests. Comparison between mutagenicity tests and data gaps for cancer tests is not valid. There is absolutely no support for the final statement.

37-40 3-28 There is no documentation for the statement that synergism rarely occurs when studies are not undertaken to test for this type of effect.

37-41 3-29 This section must admit that a factor of 10 does not account for chemically sensitive individuals and children. Not all parties will wade through the risk assessment itself. The statement cannot stand alone in this section.

37-42 3-30 Because inhalation exposure is negligible in worker exposure studies does not mean public exposure is negligible. Exposure studies ignore continued movement of sprayed chemicals hours after initial application.

37-43 3-31 Uncertainty factors and the exaggeration of risks must state the data gaps. This information is buried in the Appendix. Data gaps are uncertainty factors.

37-44 3-37/38 Risk of heritable mutations paragraphs three through five are making false statements about the probability of effects. No validated studies means no assumptions can be made about the action of these chemcials.

37-45 3-38 Which combinations of chemicals will be used in BLM programs?

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37-46 3-39 Synergistic effects based on LD/50 is a self-serving paragraph which should be removed.

37-47 3-39/40 To conclude that cumulative effects on the public will be negligible without an analysis of all management in the EIS area is unacceptable.

D-2 Herbicide design features: Buffer strips for intermittent,
37-48 ephemeral and springs must be stated. Why are buffer zones listed
in 1-10 and not here?
As the label directions for the herbicides are known why are
37-49 the divergences from stated practices not listed in items 8. and
10? Item 12 is not an assurance of quality control as this document
37-50 has no record of compliance reports.
Item 14 introduces the possibility that picloram may accumulate
in the soil. The text had assured the public that herbicide
37-51 applications will be years apart on a given site. Explain this
conflict.

37-52 D-5 Priority sampling does not establish an acceptable record of mitigation/compliance results. All projects must include water monitoring.

37-53 D-6 Item three introduces the first consideration of watershed as a criteria for project design. What is the basis for using 30% disturbance in a watershed?
These four situations should not be optional for monitoring.

37-54 Table H-1 This table should be in the narrative section and fully
discussed. A footnote that there is not enough information to even
determine the data gaps for dalapon, fosamine, tebuthiuron and tri-
clopyr is insufficient. The chemicals should be displayed in the
37-55 table. Why are drift and plant protection addressed only for
picloram?

37-56 H-43 The discussion of data gaps is illogical when applied to full formula concerns. Nowhere is it stated that there are great numbers of inert ingredients which are not on EPA List 1 or List 2 simply because the agency has not gotten around to it!

37-57 H-90 Half-lives of chemicals in ideal conditions for degradation do not begin to estimate the persistence on BLM lands. A table of environmental fate would not have taken up too much space in section F. Incorporation of information through reference is unacceptable. Brown and burn operations must have pre-burn tests for chemical persistence.

K-1 Research costs for all data gaps may be large, however, BLM could have whittled away at the list. Mutagenicity tests for all of the chemicals with these gaps is relatively cheap and fast.

37-58 L-1 Chronic wildlife dosing cannot be ignored. BLM is treating arid, low-humus sites, encouraging palatable growth. Chronic dosing will occur.

37-59 L-2 Why would grooming and preening be a highly unlikely exposure
to mammals and birds?
37-60 Why would animals have inhalation exposure for only ten

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37-60 minutes? Droplets remain suspended for hours in many cover situations where animals would presumably seek shelter.

37-61 L-3 Replacement of "lost individuals" within the next breeding cycle is unacceptable. How would there be a subsequent breeding cycle anyway? Local populations with "generally high" reproductive capacity cannot be assumed to exist.

37-62 L-28/29 This statement about 2,4-D bioaccumulating and attracting animals must be stated in the narrative section 3-20/21.

37-63 Reference section - all unpublished material should be removed from reference as well as the statements they support.

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Response to Comment Letter 37

37-1 See response 26-1.

37-2 The proposed action is seen as a balanced approach to vegetation control, using the different techniques in concert and separately as most appropriate.

37-3 It is more appropriate that management decisions be made in the other process, BLM land use plans (RMPs, etc.). It is at that level where all aspects of land management are considered, while at this EIS level we are focusing only on one narrow aspect of land management--vegetation control.

37-4 Since it is difficult to separate the EIS preparation costs among the alternatives these costs are not considered. Litigation and accidents are not predictable costs and are thus not considered. Training must occur for all alternatives and is considered to be a very small portion of the direct costs. It is understood there will be overhead costs no matter what alternative is implemented.

37-5 The source of funds is not important in the cost analysis, only the total estimated cost for each alternative which is shown in E-1.

37-6 The value of any increased forage cannot be included in the analysis as increased forage is not necessarily going to result in more AUMs leased. This can only be addressed site specifically, also see page 3-43.

37-7 Page 3-17 does not say there is an expected inability to fully fund Alternatives 2 and 3. In actuality Alternatives 2 and 3 were designed to be as reasonably funded as Alternative 1. What is said is that more treatments than proposed under Alternatives 2 and 3 are necessary but cannot be funded due to the higher treatment costs, thus less acreage is covered by Alternatives 2 and 3.

37-8 These possibilities are identified for managers to consider in decisionmaking. Often times wildlife recover quickly while impacts to an economy however slight take longer to recover, these need to be addressed on a site-specific basis.

37-9 Discussion added to page 2-9. In addition poor management in some cases exacerbates the situation and BLM is addressing these problems in land use plans and activity plans such as Allotment Management Plans.

37-10 Page 1-7 discusses the selectivity of herbicides. Many of the references listed address the efficacy of herbicides.

37-11 These are absolute minimum requirements, site-specific factors may result in greater buffers, i.e., slope, soil type, stream importance, etc.

37-12 No, it says two-thirds of anadromous stream miles on BLM are high quality habitat.

37-13 See also Appendix D. Monitoring and mitigation needs are tied to the actual site conditions. It is meaningless to say what monitoring will be done until it is known what resources exist on a site.

37-14 It means the Forest Service may reference the risk analysis for similar situations on Forest Service land rather than developing a separate worst-case analysis or other such chemical hazard.

37-15 Cumulative effects on health were addressed and an additional discussion has been added to the end of Chapter 3.

37-16 See response 34-2.

37-17 It has been edited to state that it is the northern spotted owl. A District boundary map has been added as Figure 2-2.

37-18 Budget requests are beyond the level of detail in this document. The balance of projects is determined through the BLM land use plans referred to on page 1-1.

37-19 Prescribed burns have been required to comply with air pollution control district requirements and permits for several years.

37-20 Nonpoint source water pollution is addressed under Water Quality and BMP development is discussed on page 1-5.

37-21 Most applications are not to chaparral, see Table 1-3. Also see response 31-18.

37-22 See Wright and Bailey 1982.

37-23 Several of the references address herbicide drift and entry to streams, i.e., Lavy et al. 1980; Maybank et al. 1977 and USDA, FS 1980.

37-24 That may be true for human uses, however increased flows may benefit wildlife and fish.

37-25 See response 34-25.

37-26 The California statement does include rangeland and chaparral burns and involved approximately 300 burns.

37-27 Numerous references listed address drift from target areas.

37-28 See response 35-16.

37-29 It is so stated on 3-10.

37-30 This may be true however it is necessary to identify what short term impacts may occur too.

37-31 Prescribed burn impacts are addressed on page 3-21.

37-32 See page 3-44.

37-33 This has been considered, however wildlife are somewhat mobile and due to the normal mosaic pattern of treatments, cover and food is not destroyed over a wide area.

37-34 See response 37-8.

37-35 Brown-Headed cowbirds are very adaptive to different vegetation communities, however they have not been a factor in past treatments, nor expected to be a problem. In some specific instances such as Least Bell's Vireo habitat, they have been identified as a severe problem (Goldwasser, Sharon. 1978. Distribution, Reproductive Success and Impact of Nest Parasitism by Brown-Headed Cowbirds on Least Bell's Vireo. State of California, Department of Fish and Game).

37-36 Herbicide labels contain directions for the period of time to keep grazing animals off treated vegetation. Since deer and antelope can not be controlled as livestock that factor may have to be taken into consideration. In many cases though spraying will be done more than a month before lactation occurs which according to labels is longer than livestock should be off 2,4-D treated areas (14 days). One study referenced in Appendix L recommends 3 weeks. The analysis in Appendix L shows a wide safety margin between the highly unlikely dose and 1/5 LD_{50} levels and discusses other potential effects from wildlife exposure.

37-37 Two weeks is a minimum and may be posted longer if required by label or site-specific factors.

37-38 Exposure and doses as well as no breakdown in the body assumption do tend to exaggerate the risk.

37-39 A detailed discussion of mutagenicity begins on page H-27. The process used is an accepted analysis used by toxicologists and was prepared by qualified individuals and subjected to a peer review.

37-40 Synergism studies have been done and are documented on page H-116.

37-41 The statement is simply identification of what the adjustment from animal data to human NOELs are and is the recognized methodology as stated.

37-42 If inhalation is a negligible factor for workers, it is even less of a factor for the general public due to dispersion and dilution involved with moving through the air.

37-43 Identification of data gaps has been added.

37-44 Paragraph 3 has been rewritten. In addition, when no validated studies have been done the chemical is addressed under the worst case as being mutagenic.

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37-45 The possible brands listed for use include one which is a herbicide combination: Tordon RTU is Picloram and 2,4-D. Others are possible as long as label guidance is followed and other requirements such as inerts of concern are met.

37-46 The analysis of toxic effects must start with some known benchmark; the paragraph remains.

37-47 The section referred to only addresses cumulative effects to human health from vegetation control, overall cumulative impacts are covered on 3-44.

37-48 Buffers for intermittent and ephemeral streams will vary widely depending on time of year and likelihood of flow and will be determined during site-specific project development. Buffers on 1-10 are for hand and vehicle application and a part of proposed action, while Appendix D is the minimum mitigations and further clarifies proposed actions.

37-49 All possible brands which might be used are not known at this time.

37-50 It is an assurance that BLM intends to enforce the contract requirements which includes all the items addressed on D-2 and D-3 and any others which result from the project planning phase and resulting site-specific EA.

37-51 Picloram is persistent in soil and so identified in Table 3-1 and Appendix F. In some cases noxious weed treatments require repeat treatments. In order to assure no adverse affects a specific mitigation for the possibility is included.

37-52 Not all projects will be near water, therefore all projects will not need to monitor water.

37-53 The 30 percent figure is simply a flag of warning to managers. It is not a standard or scientifically determined value. Only through site-specific monitoring and evaluation will it be better determined when the referred to cumulative effects begin to occur. In the proposed program it is not expected that 30 percent of any watershed would ever be treated with herbicides.

37-54 For those readers so inclined they are referred to this section of the Appendix.

37-55 Since there would be no entries for those chemicals they are simply noted rather than listed with blank columns.

37-56 Maybe so, however there is still no identified risk of the inerts on List 3 and until there is, BLM will utilize the latest information on inerts.

37-57 See Table 3-1.

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37-58 Herbicides do not all cause increased palatability of vegetation. The analysis includes doses from all food and water and no breakdown of chemical yet chronic doses in all cases are well below 1/5 of the LD_{50}.

37-59 Highly unlikely refers to a higher than likely application rate and dose due to conditions described, not that it is a highly unlikely exposure route.

37-60 This is based on documented studies.

37-61 The species listed do tend to be highly reproductive, in addition recruitment from offsite habitats often occurs.

37-62 It is stated that 2,4-D does not bioaccumulate. Palatability has been added.

37-63 Just because a report is unpublished does not invalidate it.

BLE

California Wilderness Coalition
2655 Portage Bay East, Suite 5 • Davis, California 95616 • (916) 758-0380

[illegible]

February 15, 1988

Mr. Ed Hastey, State Director
Bureau of Land Management (932)
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

Dear Mr. Hastey:

Thank you for the opportunity to comment on the draft environmental impact statement [EIS] for the California Vegetation Management program.

The California Wilderness Coalition supports Alternative 3, the no change/no use of herbicides alternative. This option would not result in the adverse environmental impacts that can be expected from the other two alternatives.

We cannot think of another EIS we have seen that covers so much of California with so little detail. Within the program area, BLM says there are 500 groundwater basins, 148 sensitive plant species, and over 600 species of mammals, birds, reptiles, and amphibians [including fifteen federally listed threatened or endangered species and who knows how many state listed species]. The EIS reads more like a California geography primer which gives the reader a vague overview of the state's environment. The EIS clearly is inadequate to consider the vegetation management program.

This EIS is nothing more than a thinly disguised justification for the use of herbicides on the public lands. Adverse impacts on the use of such chemicals either are not reported, ignored, or rationalized with little or no documentation.

For example, there is no mention of Proposition 65, the California state law which may ban of some of the herbicides being proposed for use by BLM. Such blatant disregard for state law is inexcusable and renders the EIS incomplete (to say the least). 38-1

Since the California Wilderness Coalition concentrates its efforts on wilderness and wilderness study areas, we will confine our specific comments to the following:

It is stated [page 2-11] that current timber
management "... allows cutting practices other than
clearcutting in most cases." If true, this means that need to
use herbicides is not great as it is in even-age management.
Yet on the following page is the incongruous statement that
38-2 "over many decades most of the forestlands that are
allocated primarily to timber production in the EIS area
would come under even-age management." Why is this
going to happen if current timber direction allows for all-age
management?

It is stated [page 3-6] that "no herbicides applied on
BLM-administered lands have been reported to reach the
groundwater." What is not mentioned in the EIS is where
and how often anyone has searched groundwater beneath or
near BLM-administered lands, if ever. What studies have
looked at such groundwater and for which herbicides was the
38-3 water tested? Considering all the variables in location,
climate, soil types, application methods, and particular
herbicides, how can it be claimed that no significant impacts
are expected to groundwater? Why wasn't the threat of
contamination to groundwater more seriously considered?

Since it is reported [page 3-13] that herbicide
applications in forested areas will be more than double over
the next ten years due to a thirty-year backlog of
38-4 treatments, has BLM been over-cutting our timber
resources? Wouldn't it have been more prudent to cut at a
lower level, a true sustained yield rate, to reflect the actual
reforestation that has been occurring in recent years?

Under Alternative 3, it is estimated that the allowable
cut would be reduced by 20 percent to 17.3 million board
feet [page 3-15]. This "loss" in timber production, and in
fact the entire BLM timber management program in
California, is insignificant when compared to the statewide
timber harvest. The argument about impacts on local
38-5 communities is questionable unless site specific information is
given to show that this small reduction would indeed have
any impact on any particular communities.

The statement [page 3-20] that "in relation to the 14
million acres of wildlife habitat on public land in California
and northwestern Nevada, these impacts are insignificant."

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38-6 This is wrong. Spraying will be concentrated in particular wildlife habitat areas, e.g. forest lands. Potential effects in these particular habitats could be highly significant to certain species of wildlife.

We are completely opposed to the use of herbicides in designated wilderness areas or wilderness study areas [page 3-22]. We consider such use in violation of the Wilderness Act of 1964 and Section 603 of the Federal Land Policy and Management Act of 1976. 38-7

Finally, we note the conclusion that "cancer risks for the proposed herbicides are low." [page 3.27] It is then pointed out that the worst case cancer risk for atrazine is less than 3 in 10,000 and for 2,4-D less than 2 in 100,000. As low as those figures may sound, BLM should be reminded that many state agencies use an action level of 1 in 1,000,000.

Sincerely,

Jim Eaton

Jim Eaton
Executive Director

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Response to Comment Letter 38

38-1 A statement has been added to page 1-18.

38-2 See response 34-2.

38-3 See response 34-25. Primarily the likelihood of no impact is due to the widespread nature of the proposed action, small amounts of treatment in widely scattered locations rather than repeat treatments in a few areas.

38-4 On page 3-15 you've turned the statement around, after 10 years treatments will be half of what is proposed herein. BLM has not been overcutting, the main reason is due to exchange of adequately stocked forest lands for previously cut brush-infested forest land. The Arcata RMP is presently proposing to adjust the allowable cut based on these land base changes.

38-5 Precisely why we will examine the issue at the site-specific project stage.

38-6 This is a general overview; each general habitat is addressed on the preceding pages.

38-7 See page 1-6.

BLE

DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service

Centers for Disease Control
Atlanta GA 30333

February 12, 1988

California State Director
Bureau of Land Management
Caifornia State Office
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

Dear Sir:

We have reviewed the draft Environmental Impact Statement (DEIS) for the California Vegetation Management program which includes an assessment of risks associated with the application of 16 herbicides in proposed vegetation management activities. We are responding on behalf of the U.S. Public Health Service and offer the follow comments for consideration in developing the Final Environmental Impact Statement (FEIS). We have found the risk assessment (Appendix H) comprehensive and well done and consistent with standard risk assessments prepared by Federal Agencies such as FDA and EPA. We agree with the conclusion that risks to human health are greatest for application workers. While the risk assessment thoroughly explores theoretical worst case scenarios for application workers (and the general public), practical field practices for reducing worker exposures are not well discussed.

39-1 For example, in the Section entitled "Exposure and Dose" (pp. H-48) a distinction is made between exposure and dose wherein dose is affected by wearing protective clothing, using a respirator, or washing immediately after spraying. In a later Section entitled "Effects of the Use of Protective Clothing", the degree of reduction of exposure is discussed. This discussion is vague and abbreviated and includes only a general reference to "wearing clean coveralls and gloves". The Section further discusses respirators and notes that "Most exposure to herbicide applicators is dermal, not inhalation, so the use of respirators is ineffective and unnecessary". This conflicting analysis of the role of personal protective equipment in exposure reduction leads to uncertainty about practical strategies for reducing levels of exposure and absorbed dose in the field. The risk assessment (or some other appropriate section of the DEIS) should contain details of proposed BLM guidance and on-site training programs for the selection and use of personal protective equipment (PPE).

BES

Clearly, to effectively reduce herbicide exposures the BLM should establish programs insuring the proper selection, donning, and use of PPE. Rubber gloves, for example, are mentioned in the risk assessment for reducing exposures. Such gloves, however, if carelessly used can, themselves, become potential exposure sources if saturated with herbicide then donned by an unsuspecting worker. Clothing which is not inspected for contamination and laundered can theoretically increase exposures to a careless worker. The Final EIS for this project should include a discussion of appropriate work practices regarding proper use, and decontamination of supplied PPE (respirators and clothing). Work practices should include demonstrations and training on the use of PPE at the beginning of the herbicide application period and at frequent intervals throughout the application period (including inspections for proper use, wear, contamination, etc.). Demonstration and training should be conducted at actual work sites to reflect representative working conditions. Supervisors should strictly enforce the proper use of PPE at all times.

Thank you for the opportunity to review this Draft EIS. We hope that our suggestions are useful in the practical translation of the theoretical assessment of exposure risks to the practical minimization of exposure at field locations. Please include us on your mailing list for the Final EIS for this project as well as NEPA-related documents on any future BLM projects with potential human health hazards.

Sincerely yours,

David E Clapp

David E. Clapp, Ph.D.,P.E.,CIH
Environmental Health Scientist
Center for Environmental Health
and Injury Control

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Response to Comment Letter 39

39-1 Requirement for PPE according to the herbicide's Material Safety and Health Data Sheet has been added to 1-7 and Appendix D.

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40

P.O. Box 245
Ft. Dick, CA 95538
February 14, 1988

Mr. Ed Hastey
California State Director
Bureau of Land Management
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

Dear Mr. Hastey:

This letter is a response to the U.S. Forestry Department and the Bureau of Land Management proposed use of herbicides for forest management.

I have read the December 1987 draft of the California Vegetation Management and find Alternative 3 the only acceptable alternative for the following reasons:

1. Many times a pesticide/herbicide has been declared "safe" only to be found to be toxic later. Take 2,4-D for instance--the American Medical Association links exposure with a six-fold increase in cancer risk, non-Hodgkin's lymphoma. Another example is the effect stated on page 3-36 that "limited exposure to 2,4-D has been reported to cause permanent nerve damage."

2. I'm not convinced that synergistic effects are not more frequently encountered than stated or even known at this time.

3. I feel that the statement that "All chemicals are injurious to health at some level of intake; even commonly consumed items such as aspirin, table salt, and sugar" ridiculous. We make choices as to the level of intake; it is not introduced into our environment like air, water and soil and at levels in which we have no control.

4. Even though Alternative 3 costs $28.75/acre it is well worth the extra $2.76/acre not to pollute the earth, harm animals, expose workers to toxic chemicals, etc. Some of the chemicals that are to be used have not been studied to see if they harm wildlife. I'm not proposing such a study, but just pointing out that you are not aware of all the effects exposure causes to us creatures.

5. I gather herbs for my use and to sell and want them to be natural.

172

49-1 In using Alternative 3 many unemployed people would be employed. I don't think there would be as much danger to these workers as there would be to the workers exposed to all those toxic chemicals. And there would be thousands of homeless people that would be thankful for a job.

49-2 The statement that "Many people believe that herbicides are safe to use and that risks associated with herbicide use are acceptable to themselves as individuals and to society" is pointless because these people are ill advised and uninformed.

49-3 I would like a list of the areas that have been sprayed in Northern California. Please include what chemicals were used.

Thank you for the opportunity of reading and commenting on the draft.

Sincerely,

(Ms.) Deanna McNallen

BES

Response to Comment Letter 40

40-1 Alternative 3 would not create "thousands" of jobs; the EIS points out no significant changes to employment.

40-2 We are merely conveying the opinion of some people.

40-3 BLM does not maintain this information. County Agricultural Commissions may have this data.

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EPIC
Environmental Protection
Information Center, Inc.

P.O. Box 397
Office: [redacted]
Garberville, CA 95440
(707) 923-2931

address for Sutherland:
P.O. Box 996
Redway CA 95560

12 February 1988

Ed Hastey, State Director
Bureau of Land Management (932)
c/o Mark Blakeslee
2800 Cottage Way
Sacramento CA 95825

Dear Mr. Hastey,

Please carefully consider these comments on the Draft Environmental Impact Statement for California Vegetation Management (hereafter DEIS). These comments are submitted both on behalf of myself, as an individual, and on behalf of the Environmental Protection Information Center, Inc. (EPIC), a California non-profit corporation. Please respond separately to both of us at the letterhead addresses.

4-86

Not unexpectedly, your DEIS is inadequate. I say this based on my experience with BLM's past and present vegetation management efforts in the Ukiah District. First, it is obvious that much of the vegetation management which has been practiced was quite unnecessary and not well thought out. For example, in a special Nooning Creek program, large amounts of brush were windrowed and burned. Unfortunately, virtually all this brush was Ceanothus, and burning it meant an enormous loss of nitrogen, most likely most of the nitrogen on the site. Nitrogen is the primary limiting nutrient in most wildland sites. One or more approaches could have been adopted which conserved most site nitrogen. This is an example where management objectives could better have been achieved with less intensive management. Another failed management project, this a recent one for wildlife, occurred on Queen's Peak, where an unnecessary and inappropriate burn did not significantly improve site conditions. It is apparent that much of BLM's vegetation management program is actually unneeded and this should have been explored in the DEIS. I propose as a mitigation that all project proposals should receive very early and repeated peer review from other agencies, especially non-federal, and also selected public review. 41-1

A somewhat more outrageous exclusion from the DEIS is the subject of escaped burns. I strongly wonder, however, if the preparers even had access to adequate data on this, because embarrassed managers have probably hidden much of it. In the Ukiah District, a scandalously high percentage of control burns have escaped. A recent BLM escape near Tolkan Campground, for example, appears to have destroyed more commercial timber than it conceivably could have released, at best. These escapes not only increase suppression costs and damage non-target wildlands,

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they are a serious hazard to the neighborhood and my neighbors
and I resent being endangered by unpublicized BLM and CDF
incompetence. Please take the cutesy all-is-well shine off your
41-2 DEIS and discuss these real problems in detail. I call for an
investigation and report of the true incidence of these escapes.
I expect this will take a very thorough effort to fully uncover.

The DEIS discussion of smoke is very superficial. Timber
industry burning each fall is a severe problem in our region,
and BLM contributes to this problem. Smoke is at times so thick
in forest towns such as Whitethorn that it is necessary to drive
with headlights on during otherwise sunny days. The human health
41-3 problem of this smoke is quite understated in the DEIS. Cite for
example the many hundreds of cases of pneumonia and other serious
lung ailments Forest Service and CDF personnel experienced during
just the severe fall 1987 wildfires in California. These figures
are readily available and illuminating. I also do not find
acknowledgement in the DEIS that most "controlled" burning (by
all parties including BLM) occurs in a very short space of time,
greatly intensifying effects. By such omissions the DEIS thus
obscures the pressing need to greatly reduce unnecessary burning.
This is a legally inadequate examination of alternatives and it
stands as another example of how the DEIS is a rationalisation
of foregone conclusions. As mitigation for smoke abatement I
suggest strict standards and public and peer review of vegetation
management proposals. These standards should require that timing
41-4 of BLM burns (if genuinely necessary in the first place) be
coordinated with other regional burns and wildfire activity so
as to minimize smoke impacts. No burns should be conducted when
other smoke sources are impacting the area.

Your refusal to seriously examine non-burn or less-burn
41-5 alternatives is indefensible, not withstanding the shabby arguments
at DEIS 1-4. Please reconsider.

Another shortcoming of the DEIS is the unrealistic assessment
of the social problem of herbicide drift. The DEIS misjudges that
41-6 many thousands of people live in California's remote wildlands
explicitly for the purpose of achieving relatively pollution-free
lives. Aerial drift of herbicides unavoidably contaminates them
and constitutes a serious assault on their lifestyle. You are well
aware how inflamatory this can be and it should be examined in
the DEIS. Sabotage, threats, and gunfire have repeatedly characterised
California herbicide confrontations. This fact should be provided
clearly to the decisionmaker. If only for these social reasons,
the insistence on herbicide use (especially if aerially applied)
reflects an apparent social arrogance and insensitivity unbefitting
a preferred alternative. Please reconsider your emphasis.

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41-7 Frankly, I can hardly believe how poor your treatment of pesticide drift is. It is based upon an agricultural model quite inapplicable to the mountain habitats that BLM proposes to spray. How can this be adequate? Please adapt the DEIS analysis to mountain models; for example, consult "Drift of insecticidal spray by cold air drainage winds in western mountains", by George Markin (USDA For. Ser. Research Note PSW-380). This long-suppressed Forest Service study affirms that "(t)he possibility of drift occurring during forest spraying appears to be considerably greater than in agricultural spraying." Further, the study "demonstrated that cold air drainage winds carried large amounts of spray, sometimes equal to the amount that landed in the spray plots, out of the target area." Recommendations included by Markin could be adapted as DEIS mitigations. Global drift of pesticides,has been well documented, literally to polar icecaps, to remote islands, and to the snows of Kilimanjaro. The slighted DEIS treatment of drift is another good example of why few will greet it as a credible document. The DEIS seems more a testimonial to BLM's intransigence in heading inexorably towards violent social and political confrontation. Why do you persist in a lose-lose mindset?

41-8 The DEIS fails to note that it is a committed mitigation in the SYU-13 FEIS that there will be no aerial herbicide use in Sustained Yield Unit 13. Please do not imply through silence that this DEIS overrides that commitment. Legally it cannot. Thus it appears this DEIS cannot properly address the issue of such spraying in that region, as it does.

Please respond fully to our concerns.

Sincerely,

Themanwhowalksinthewoods

("Robert Sutherland")

Response to Comment Letter 41

41-1 Site-specific project planning and the EA process allow just this sort of coordination and consultation. BLM also coordinates with other agencies as identified on pages 1-16 and 1-17.

41-2 BLM records on escapes from prescribed burns have been reexamined and the number of escapes over the past 10 years should be four. This number has been changed in the Final EIS. In addition, of the four escapes none exceeded 100 acres in size.

41-3 A lengthy discussion is contained as Appendix G.

41-4 All prescribed burns must be permitted according to local Air Pollution Control District requirements. BLM only burns when the APCD allows and they do consider other burns in the area.

41-5 Due to the State of California's emphasis on chaparral management there is little likelihood of BLM being able to unilaterally not conduct prescribed burns.

41-6 The antiherbicide feeling of many people is noted starting on page 2-21. The incidence of wildland residents is an issue which will be addressed during project formulation.

41-7 The majority of aerial spraying is not proposed for mountain areas, well over half of the acreage is for sagebrush areas (Table 1-3). While the models used may have been derived from agricultural applications, they used equipment and techniques similar to what is proposed in the EIS. The air quality assessment discusses the possibility of spray drifting long distances.

41-8 This has been clarified on page 1-1.

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J.A. Ferrara
Bx 522
Covelo, CA 95428

February 12, 1988

California State Director
Bureau of Land Management (932)
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

re: "California Vegetation Management" DEIS

Dear Mr's Hastey & Blakeslee —

In response to this DEIS, I would like to offer the following considerations which should be addressed in a supplement or in the final EIS: 88-4

42-1 1. Analyze and discuss the effects of fuel loading which resu from even-age timber management (clearcutting).

42-2 2. Describe the natural burn cycles for each vegetative typ and discuss the effects of proposed vegetation management on those cycles.

42-3 3. Analyze and discuss the cost/benefits of vegetative manipulation for "grazing" range improvement.

42-4 4. Describe the actual mitigation techniques which wou be used under the proposed action.

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42-5 5. Substantiate claims that vegetation management will benefit wildlife species which are poisoned by such activity.

42-6 6. Analyze the effects on local employment of manual vs. aerial spray.

7. Disclose the assumptions upon which your timber yield tables are based.

42-7 8. Describe the relevance of the data gaps concerning the commercial forest land with vegetation types where the need for herbicides is unknown.

9. Describe the relationship between stocking capacity and projected timber yields and admit the probability that your yield tables may significantly overestimate both.

42-8 10. Describe the relevance of the many uncertainties about the silvicultural effectiveness and toxicity of herbicides as they pertain to their possible effects, including actual worst case analyses: dead trees and dead people.

42-9 11. Describe and consider the beneficial effects of other plants in the tree plantations (nitrogen fixation, shade and shelter, slope stabilization, etc.).

42-10 12. Analyze previously sprayed areas for long-term effects, especially on "non-target" plants and animals endangered species, etc.

42-11 13. Admit to significant data gaps concerning the ful formulation of chemicals that actually get sprayed, includ so-called "inert" ingredients whose identity is protected

③

(13. continued:) by trade-secret laws.

42-12 14. Add implementation guidelines to ensure that individuals exposed to toxic chemicals do so only with their "informed consent".

42-13 15. Consider the establishment of Toxic-Free Zones surrounding salmon spawning beds, important wildlife habitat, and all residences.

16. Your health damage testing of economic poisons, biocides and agrotoxins is biased against the future of the environment and its humans.

42-14 17. The risks of using the known ingredients, compounded with the risks of secret ("inert") ingredients, pose greater threats to humans and other animals than you are willing to admit.

42-15 18. What the DEIS describes as "competing and unwanted vegetation" are, in the deforested environment, natural associations of plant species which have evolved to occupy the niches created by catastrophic events, such as so-called intensive timber management.

42-16 19. In your efforts to discourage the further proliferation of "unwanted" vegetation in California's Public Lands, the only ecological alternative is to stop clearcutting them.

20. Therefore, I support the "NO ACTION" alternative.

Sincerely —
J.A. Ferrara

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Response to Comment Letter 42

42-1 Most forests are managed on an uneven age basis and in those which are clear cut most slash is burned, reducing fuel loading.

42-2 This is beyond the scope of the EIS and can be found in books such as Wright and Bailey 1982.

42-3 This is discussed on page 3-43.

42-4 Mitigations are addressed in Appendix D and additionally would be developed based on site-specific features.

42-5 The slight probability of toxic effects to wildlife as identified in Appendix L is outweighed by the beneficial changes in some habitats and forage as identified in Chapter 3.

42-6 This was addressed on page 3-26.

42-7 These issues were thoroughly addressed in the SYU-8, 13 and 15 EISs and EA are referenced on page 2-12.

42-8 The unlikelihood of toxic effects to people is addressed in Chapter 3 and Appendix H. Herbicide labels and references cited document on what species chemicals are injurious. Proper chemical selection, timing of applications, and amount applied will prevent death to nontarget species.

42-9 Appendix C addresses vegetation control in plantations. It addresses control and reduction of competition of other plants not their complete removal.

42-10 See response 28-3.

42-11 See pages H-41 to H-45.

42-12 BLM is so required under 29 CFR 1960.34(b). and is noted on page D-3.

42-13 This is addressed on page D-1.

42-14 Same as response 42-11.

42-15 This may be true, however in reforestation attempts they are competing vegetation which would slow the reestablishment of commercial forests.

42-16 The majority of lands covered does not involve forests, but range and chaparral. In addition as stated on page 2-12 much of the harvesting is by selective cuts rather than clear cuts.

43

R. Edward Burton

EBC COMPANY
BIOMASS UTILIZATION
WASTE WATER RESEARCH

707-459-6219

February 16, 1988

Mr. Ed Hastey, State Director
U. S. Department of the Interior
Bureau of Land Management
California State Office
2800 Cottage Way
Sacramento, CA. 95825

Dear Mr. Hastey:

I am enclosing "The Use of Forest Products in the Pollution Control Industry" as an example of the type of market that can be developed for material you now regard as weeds.

When I first worked in the woods in Santa Cruz County in 1938 our major money crop was tan bark from the tan oak.

4-90 We are currently using charcoal from Manzanita or Madrone for odor control, BBQ fuel, water filtration and other uses.

New methods of harvesting such as the shear one making "weed" species valuable.

43-1 It is estimated that the pollution control industry will cost 90 billion dollars per year. The annual growth of energy fuel from chapparal is enormous and can be sustained indefinitely improving the habitat and lowering the fire hazard at the same time. Your EIR devotes only one paragraph to manual removal with no discussion of possible markets for the material.

I invite you and your staff to review this potential and include it in your final EIR report.

Yours very truly,

Edward Burton

REB:nmk

Enclosures

cc: Phillip Lowell

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Response To Comment Letter 43

43-1 The material provided has been retained for future reference and we have added a statement regarding potential markets for materials.

United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VA. 22092

In Reply Refer To:
WGS-Mail Stop 423

FEB 1 6 1988

Memorandum

To: California State Director, Bureau of Land Management
Sacramento, California

From: Assistant Director for Engineering Geology

Subject: Review of draft environmental statement for the California vegetation management program

We have reviewed the statement as requested in your letter included in the document.

44-1 The statement should recognize the importance of soil characteristics, local climatic conditions, and geologic settings in planning the use of herbicides and appropriate mitigation of impacts to water resources. Adsorption and biodegradation of herbicides, for example, are most effective in warm, moist soils with high content of clay, high organic content, and relatively low pH. Deviations from these conditions will reduce the effectiveness of adsorption and biodegradation. Furthermore, the presence of sandy and gravelly soils may result in less retardation of herbicides. Also, timing of precipitation following herbicide application may be critical, for untimely precipitation may flush the chemicals rapidly into the soil and into underlying aquifers. In areas where thin soils overlie fractured rock, opportunities for more rapid downward movement of herbicides may occur. Lateral movement of atrazine within an aquifer is relatively slow but atrazine has been found in groundwater from wells downgradient from irrigated fields at the end of an irrigation season.[1]

44-2 At this present programmatic stage of the analysis, the discussion of plans for mitigation should indicate pertinent controlling factors to be considered in the various site-specific analyses. Examples are: soil sediment characteristics, pH, soil permeability, presence or absence of fractures and cracks at or near the surface, depth to water, and precipitation or irrigation timing with respect to chemical application.

James F. Devine

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[1] Junk, G.A., Spalding, R.F., and Richard, J.J., 1980, Areal, Vertical and Temporal Differences in Ground Water Chemistry: II. Organic Constituents: Journal of Environmental Quality, vol. 9, no. 3, p. 479-483.

Copy to: District Chief, WRD, Sacramento, California

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Response To Comment Letter 44

44-1 The importance of these factors on chemical behavior is discussed on page 3-3 and the pretreatment survey process discussed on D-1 requires consideration of soil factors in designing projects and setting restrictions, mitigations, and monitoring.

44-2 Due to the wide variety of situations which might be encountered it is more appropriate that mitigations be identified during site-specific pretreatment surveys and project environmental analyses using label guidance and site-specific information.

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Pacific Gas and Electric Company
77 Beale Street
San Francisco, CA 94106
415/972-7000

February 24, 1988

California State Director
Bureau of Land Management (932)
c/o Mr. Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

Dear Mr. Blakeslee:

Thank you for the opportunity to review your December 1987 California Vegetation Management Draft EIS. We are pleased to see a program which evaluates all methods of vegetation management. We interpret the preferred alternative as a program which would provide us with the greatest flexibility when managing vegetation on our right-of-ways. Hence, we support the preferred alternative. However, there are several issues which we would like to have clarified.

As an adjacent land owner and permittee of BLM lands, we have a variety of land management concerns that are tied to specific geographic locations. Due to the general nature of the document, it is difficult to assess the potential for conflict or negative impact on our operations from your preferred alternative. Issues such as safety of our employees, ease of maintenance, water quality and erosion control on watershed lands, and hazard avoidance on our electric and gas transmission right-of-ways are impacted differently depending upon what treatment is applied. The following are the specific issues which need clarification:

1. Chapter One, Page 3, "annual acreage to be managed by various vegetation treatments:"

   45-1 If the geographic location of the acreage has been determined by your Land Management Plans, please provide maps for review and comment. If the vegetation management treatments have not been allocated geographically, we request that we be consulted prior to any decision which involves designation of vegetation management treatments on or adjacent to our lands and right-of-ways.

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2. Chapter One, Page 18, "notification of adjacent landowners prior to spraying of herbicide:"

45-2 We have employees that traverse BLM lands as a part of their daily operational routines. In addition to advance notification of specific incidences of aerial spraying, we need to inform these employees of the potential occupational hazards due to chemical maintenance if this treatment is to be consistently used in the area. Such notification will need to include all industrial safety bulletins pertinent to the type of chemical agents to be used.

3. Chapter 3, Environmental Consequences:

45-3 The impacts of prescribed burning on or near our distribution and transmission line right-of-ways, both gas and electric, and their related facilities, including metering, regulator, and microwave stations, need to be evaluated. Such a technique implemented in these areas could not only be detrimental to our facilities, but provide an extreme hazard.

We hope these comments are useful to you, and once again thank you for the opportunity to be involved in your planning process. If you have any questions regarding these comments, please contact Nancy Brose at (415) 973-5775.

Sincerely,

Bruce Benzler
P. BRUCE BENZLER
Director
Land Planning

Response To Comment Letter 45

45-1 Specific treatment sites have not yet been delineated. As is noted on page 1-18 as a part of project formulation and required EAs we intend to consult with adjacent landowners.

45-2 See response 45-1. In addition, signs will be posted as noted on page B-1 in accordance with chemical guidelines.

45-3 Prescribed burning is avoided near such improvements, in fact chemical use may be proposed near sites such as microwave towers to decrease wildfire hazard to these improvements.

46

United States
Department of the Interior

Fish and Wildlife Service
Lloyd 530 Building, Suite 1692
500 N.E. Multnomah Street
Portland, Oregon 97232

In Reply Refer To:

Your Reference:

FEB 2 9 [illegible]

To		Initial
1	SD	
3	ASD	
	ADMIN	
4	RFS	
	[illegible]	

Ret –

Action by ______
Response by ______
Return to ______

Memorandum

To: State Director, Bureau of Land Management, Sacramen
California

From: Acting Regional Director, U.S. Fish and Wildlife Service,
Region 1, Portland, Oregon

Subject: Review of the Draft California Vegetation Managemen
Plan (Plan) and Environmental Impact Statement (DEI
(EC 87/95

The U.S. Fish and Wildlife Service (Service) has reviewed the Bureau of Land Management's (Bureau) subject plan and DEIS which describes three alternatives for vegetation control on public lands in California and northwestern Nevada. Areas to be treated annually vary from 35,800 acres under Alternative 1 to 30,550 acres under Alternative 3. The primary difference among the three alternatives is the means proposed for control. Alternative 1 (the proposed action) will employ aerial and ground application of herbicides and several non-herbicide means of vegetation control; Alternative 2 (no aerial herbicide application) will use herbicides only through ground application; and Alternative 3 (no change/no use of herbicides) will not use any herbicides at all. The objectives to be accomplished under the proposed action consist of: (1) control of noxious and poisonous weeds; (2) maintenance of rights-of-way; (3) reduction of fuel load, and (4) improvement of forest management, range management, wildlife habitat, and recreation sites. 46-1 Alternative 3 is not actually a continuation of the "status quo" because it increases the areas where manual and mechanical control means would be employed. A "no action" alternative is needed in order to fully comply with the National Environmental Policy Act. In general, there is a paucity of detail in the descriptions of the three alternatives.

The Service offers the following general and specific comments for your consideration.

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General Comments

46-2 Even though this DEIS is a programmatic statement for vegetation control on Bureau-administered lands in California and northwestern Nevada for the next 10 years, it presents a very general overview and analysis of the proposed project. Because of this, very detailed site-specific environmental documentation will be necessary when the Bureau undertakes individual vegetation treatment and management projects. These projects should be thoroughly coordinated with the appropriate State and Federal natural resource agencies, including our field stations, early in the process for planning and environmental review process.

46-3 The DEIS generally focuses on the direct impacts to wildlife from each alternative for vegetative management. Even though the DEIS identifies negative and positive impacts to wildlife, neither the significance of these impacts are evaluated nor the steps for avoiding or mitigating wildlife losses are identified. In addition to fully evaluating the direct impacts, the DEIS should also address the cumulative and indirect impacts to wildlife. These concerns should be fully analyzed in the wildlife risk assessment, as outlined on page 7.

46-4 Initiation of formal consultation pursuant to Section 7 of the Endangered Species Act of 1973, as amended, is necessary whenever a federally-listed species may be affected. The Service's Biological Opinions will specify measures needed to prevent, reduce, and/or offset anticipated adverse project effects to federally-listed species.

46-5 The use of chemicals, including herbicide application, can be a highly beneficial management tool for protection of sensitive species. The use of the herbicide Tordon, for example, is crucial for both controlling tamarisk (Tamarix spp.) and maintaining some desert species dependent upon native riparian and marshland habitats. An example of such a species benefiting is the federally-listed endangered Amargosa vole (Microtus californicus scirpensis). We want to point out that the use of Tordon has resulted in some effects to aquatic wildlife and the risk of using Tordon needs to be fully addressed.

The Bureau should also consider control and eradication of other weeds such as the giant reed (Arundo donax) and pampas grass (Cortaderia atacamensis). Both have been observed at locations along the Mohave River in the California Desert District, and are considered to be very invasive with no value for native wildlife. Eradication of these species would benefit both native plants and animals.

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46-6 Use of fire to enhance wildlife habitats should be carefully evaluated on a site-specific basis to determine the feasibility and success for attaining desired wildlife objectives. Whenever a herbicide or fire is used to control tamarisk, the root structures should be mechanically removed to ensure control.

46-7 The DEIS does not clearly state the Bureau's policy for establishing buffer zones around wetlands. We recommend establishing buffer zone widths on a site-specific basis, using environmental, biological, and toxicological factors to protect wetland habitats. Our definition of wetlands includes all categories of marshes, bogs, and estuaries and all classes of streams (FWS/OBS-79/31, December 1979 Classification of Wetlands and Deepwater Habitats of the United States).

In summary, we recommend against the proposed action (as outlined in Alternative 1) due to the potential for aerially applied herbicides contaminating wetlands through spray drift. The indirect and cumulative impacts of herbicide application upon fish and wildlife need to be evaluated. The site specific plans and environmental assessments for individual treatment projects should be detailed. The criteria for site-specific plans should be carefully designed to ensure that there will be minimal impacts to fish and wildlife resources.

Specific Comments

46-8 Proposed Treatments by Plant Community, Table 1-3. Under the subheading "Purpose", there are several inaccurate descriptions such as "Chaining, crushing", "noxious weeds", etc. These terms describe a treatment method or the problem and not the purpose. They should be corrected in the EIS.

Chemical Methods, page 1-10, paragraph 2. The description of the criteria for using the "handgun and boom" technique for applying herbicides in riparian areas is inadequate. The Bureau bases the need for using the handgun and boom technique on the presence of weeds being "closely intermingled" with shrubs and trees. No criteria is provided to protect non-target vegetation. The Bureau needs to establish criteria for determining the threshold for spraying when native vegetation is present.

46-9 These criteria should establish an upper limit for native vegetation density and a standardized means for determining the density of native vegetation. Until these criteria are established, the Service recommends that handgun and boom applications in the riparian zone only when vegetation is composed primarily of weeds, based on a vegetative survey of the proposed treatment area. We recommend coordinating such surveys with our local field stations.

46-10 *Comparison of Impacts, page 1-13, Table 1-4*. The Summary of Impacts by Alternative should include analyses of indirect impacts and cumulative impacts to wildlife. These potential impacts include nest abandonment and contamination or alteration of food supplies for various wildlife species.

46-11 *Monitoring and Studies, page 1-15, paragraph 2*. Except for line 2.a of Appendix D, the Bureau fails to discuss wildlife monitoring and residue studies. Although the Bureau states that some vegetation treatments are specifically designed to improve wildlife habitat, we find no analysis in the DEIS addressing impacts to wildlife. The impacts to resident and migratory species needs to be assessed before any monitoring programs can be established. These monitoring programs should be designed in cooperation with appropriate State and Federal natural resource agencies and implemented to evaluate the responses of selected wildlife species to the vegetation treatments.

46-12 *Threatened, Endangered, and Sensitive Plant Species, page 2-9 and Table 2-2*. The slender horned spineflower (*Centrostegia leptoceras*) and Santa Ana River eriastrum (*Eriastrum densifolium* spp. *sanctorum*), identified in the text as species proposed for listing, have been listed as endangered (52 Federal Register (FR) 36265; September 28, 1987).

Threatened, Endangered, and Sensitive Animals, page 2-17 and Table 2-4. These sections should be revised to contain the following updated information:

Mohave ground squirrel	Category 2 candidate 50 FR 37965; September 18, 1985
Stephen's kangaroo rat	Proposed 52 FR 44453; November 19, 1987
California bighorn sheep	Category 2 candidate 50 FR 37967; September 18, 1985
Peninsular bighorn sheep	Category 2 candidate 50 FR 37967; September 18, 1985
California wolverine	Category 2 candidate 50 FR 57967; September 18, 1985
Least Bell's vireo	Endangered 51 FR 16482; May 2, 1986
Inyo brown towhee	Endangered 52 FR 28780; August 28, 1987

The Bureau needs to substantially revise these sections to adequately address the needs of both federally listed and proposed species occurring on Bureau lands.

4613 Even though candidate species receive no legal protection under the Endangered Species Act, we urge the Bureau to provide for them during project planning in the event that they are listed prior to or during project implementation. The following list of category 2 candidate species (50 FR 37958-37967; September 18, 1985) is provided for your consideration:

Fish	
Amargosa canyon specked dace	Rhinichthys osculus ssp.
Razorback sucker	Xyrauchen texanus
Amphibian	
Arroyo toad	Bufo microscaphus
Reptiles	
Western pond turtle	Clemmys marmorata
Panamint alligator lizard	Elgaria panamintinus
Colorado Desert fringe-toed lizard	Uma notata notata
Orange-throated whiptail	Cnemidopherus hyperythrus
San Diego horned lizard	Phrynosoma coronatum blainvillei
Birds	
Reddish egret	Eghretta rufescens
White-faced ibis	Plegadis chihi
Fulvous whistling Duck	Dendrocygna bicolor
Swainson's hawk	Buteo swainsoni
Ferruginous hawk	Buteo regalis
California black rail	Laterallus jamaicensis coturniculus
Western snowy plover	Charadrius alexandrinus nivosus
Mountain plover	Charadrius montanus
Long-billed curlew	Numenius americanus
Large-billed savannah sparrow	Passervullus sandwichensis rostratus
Tricolored blackbird	Agelaius tricolor
Mammals	
Occult bat	Muyotis lucifugus occultus
Southwestern cave bat	Myotis velifer brevis

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Spotted bat	*Euderma maculatum*
Townsend's western big-eared bat	*Eumops perotis californicus*
Palm Springs ground squirrel	*Spermophilus tereticaudus chlorus*
Amargosa pocket gopher	*Thomomys umbrinus amargosae*
White-eared pocket mouse	*Perognathus alticola alticola*
Tehachapi pocket mouse	*Perognathus alticola inexpectatus*
Yuma cotton rat	*Sigmodon hispidus eremicus*
Colorado River cotton rat	*Sigmodon arizonae plenus*
Owens Valley vole	*Microtus californicus vallicola*
Yuma puma	*Felis concolor browni*

46-14 *Wildlife Habitat, page 2-15*. In addition to northeastern California and the California desert, chukar populations also occur in northwest Nevada (including Washoe and Humboldt Counties).

46-15 *Impacts on Surface Water, page 3-5, paragraph 3*. The summary information on Diuron notes a longer persistence (up to 24 months) causing significant toxic effects on fish and lower aquatic organisms. For these reasons, the Service recommends banning the use of this herbicide in proximity to wetlands. Additional restrictions will be needed to prevent Diuron from entering any wetland due to runoff and drift from aerial and ground applications.

46-16 The use of 2,4-D should be limited to areas where soil conditions promote rapid degradation (moist, warm soils with high organic content). Because the toxicity of 2,4-D and 2,4-DP to aquatic organisms are highly variable, we do not recommend the use of these herbicides at sites in proximity to wetlands.

46-17 *Impacts on Surface Water, page 3-5, paragraph 4*. The statement that "Often no effort is made to exclude aerial spraying across ephemeral stream channels" and "rainfall can flush herbicide residues downstream", is objectionable and inappropriate. 46-18 These streams and their ecosystems are wetlands which need to be protected. The Bureau should stipulate application procedures and conditions to its contractors to ensure that no aerial spraying of wetlands will occur, if an aerial spraying alternative is selected.

46-19 *Noxious Weeds, page 3-13, paragraph 3*. The DEIS notes that non-target vegetation would be lost through aerial application without determining the extent of impacts. Any evaluation of the impacts should include the loss of non-target vegetation intermingled with weeds, method and rate of herbicide applications, formulation of herbicide, and use of alternative herbicides used. To minimize the loss of non-target vegetation,

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the Bureau should establish criteria for spraying weeds intermingled with non-target vegetation (refer to comments for "chemical methods, page 1-10, paragraph 2"). If losses of non-target vegetation should occur, standby mitigation plans should be implemented.

Chemical Treatments, Alternative 1, page 3-16 and 17, paragraphs 1, 2, 5, 6, and 7. The DEIS identifies potential adverse impacts to winter ranges of deer, antelope, and sage grouse from large-scale application of herbicides. If herbicides are applied on a large scale, we recommend using a mosaic spray pattern to counteract the additive effect of treating a large area.

Paragraph 8 states that herbicide use on 900 acres of forested
lands per year will ultimately result in long-term reduction in
deer forage. The health and size of California's deer herd has
generally been decreasing, as noted by the California Department
of Fish and Game. While the treatment of chaparral areas is
46-20 expected to improve deer habitat, no information is presented to
verify whether the net change in deer habitat would be positive.
The Service recommends that the Bureau develop treatment schedules
and monitoring plans in consultation with the California Department of Fish and Game.

46-21 Appendix L, Details of the Wildlife Exposure Calculations, page L-21, paragraph 1. We believe that the Bureau should not extrapolate wildlife exposure data from wildlife species typical of forest habitats in the Northwest. Toxicological evaluations should be based on requirements of animals adapted to the extremely arid conditions found in the deserts of California. Many xerophilous species have evolved elaborate physiological adaptations which may be affected adversely by exposure to certain herbicides.

46-22 We recommend including an environmental risk assessment based on the chemical and biological data provided in Appendix L. It should address factors, such as effects on the nutritional and cover value of treated, non-target vegetation to selected wildlife species, effects on breeding and nesting success of exposed wildlife species, cumulative effects of repeated applications of herbicides, and exposure to the carrier (solvents and other inert ingredients) of the herbicide spray on the food web dynamics.

If you have any questions or need any points elaborated upon, please contact me at the letterhead address or call John Wolfe, Contaminants Specialist (FTS 429-6128) or Merle Richmond Environmental Specialist (FTS 429-6159).

Response to Comment Letter 46

46-1 See response 34-1.

46-2 See pages 1-16 and 1-17.

46-3 The impacts to wildlife are anticipated to range from low to negligible as stated on page 3-13. In most cases the impacts will be unmeasurable on a statewide basis. However, site-specific environmental analyses will be prepared as individual sites are selected. Impacts will be quantified and mitigation will be developed at that time.

46-4 Discussed on page 1-16.

46-5 We are aware of this and also that recent studies by other agencies have found triclopyr to be as effective as picloram and less environmentally hazardous.

46-6 See page 1-15 for requirements for EAs on each project.

46-7 Buffers will be set according to label requirements, State or local law (page 1-10) and site-specific factors (page D-1).

46-8 Comment noted and changes made as necessary.

46-9 The EIS says "Neither handguns nor booms would be used in riparian areas where weeds are closely intermingled with shrubs and trees." Hand applications would be used in the intermingled areas, and we agree with your comment regarding presurvey of the treatment area.

46-10 Due to the small amount of habitat treated compared to the statewide total, these indirect impacts will be insignificant. This comment however points out a good opportunity to collect some information on nest abandonment, alteration of food supplies, etc., in localized areas. This type of information in the literature is very sketchy and incomplete. We may be able to increase our knowledge in these areas through studies and monitoring of projects.

46-11 Impacts of site-specific projects, mitigations, and monitoring needs would all be identified during the project development and EA based on the site-specific factors as noted on page 1-15.

46-12 Those changes have been made.

46-13 We have chosen not to list the Category 2 species, however they will be considered at the site-specific EA stage.

46-14 Correction made.

46-15 The discussion on page F-7 also notes that diuron is one of the least mobile herbicides. Other herbicides have a longer persistence and are more mobile than diuron and would thus be more hazardous near wetlands. In addition, diuron is not proposed for aerial application.

46-16 Such a determination as with your 46-15 comment would be addressed on a site-specific basis.

46-17 It may be objectionable and inappropriate, however it is a statement of fact.

46-18 Not all ephemeral channels are wetlands, however as with other water areas these areas will be considered during pretreatment surveys and project development for any necessary buffers or other mitigations.

46-19 Aerial application for noxious weed control is not proposed.

46-20 Follow-up monitoring and coordination with the California Department of Fish and Game will be an integral part of all land treatment projects.

46-21 The species addressed are also representative of California forests, sagebrush and chaparral areas. Since a majority of the proposed treatments will occur in these areas the information is appropriate. When applying the information to desert species the arid adaptations of animals will have to be taken into account individually, the basic data for this analysis would come from the same species documented herein as there is little specific data on desert wildlife species.

46-22 Appendix L is a risk assessment addressing chemical effects based on possible doses of several exposure routes. Cover values were addressed on pages 3-19 to 3-22. Cumulative effects are now addressed at the end of Chapter 3.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
215 Fremont Street
San Francisco, CA 94105

01 MAR 1988

Ed Hastey
California State Director
Bureau of Land Management (932)
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

Dear Mr. Hastey:

The Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) titled California Vegetation Management.

Under the National Environmental Policy Act and Section 309 of the Clean Air Act, EPA is required to review and comment on this DEIS.

We have classified this DEIS as Category EO-2, Environmental Objections - Insufficient Information (see attached "Summary of Rating Definitions and Follow-Up Action"). This DEIS is rated EO due to potential impacts to water quality/beneficial uses which could result from vegetation management activities. 47-1 Additionally, the DEIS does not adequately identify its relationship to the planning process conducted for individual resource management plans or the process to be followed regarding environmental documentation for individual vegetation management projects. We are available to meet with you to discuss our concerns.

We appreciate the opportunity to review this DEIS. Please send us three copies of the Final EIS when it is filed with the EPA Headquarters office. If you have any questions, please call me at (415) 974-8083 (FTS 454-8083), or have your staff contact David Powers at (415) 974-8187 (FTS 974-8187).

Sincerely,

Deanna M. Wieman, Director
Office of External Affairs

Enclosure (8 pages)

cc: M. Blakeslee, BLM
J. McKevitt, USFWS
J. Schuler, CDFG
J. Ladd, SWRCB
R. Gill, Lahontan RWQCB
S. Warner, North Coast RWQCB

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Water Quality Comments

1. 47-2 The Soil and Water Quality discussions contained in the DEIS are inadequate. While these areas include a literature review, there is no attempt to draw conclusions or offer guidelines which would assist the resource manager in selecting the herbicide that would minimize environmental impacts in the soil and water. The FEIS should identify guidelines for making decisions about the use of herbicides including the following decision criteria: soil type, slope, aspect, precipitation (amount, type & distribution), temperature, partition coefficients, application (method, rate & amount), repeated or combined applications, proximity to ground water or surface water and stream/ground water monitoring requirements. If possible, this information should be displayed in a table or matrix which allows comparison of the persistence of the chemicals proposed for use in different soil types and water. This would assist resource managers and the general public in assessing potential impacts.

2. 47-3 The FEIS should identify the process and criteria that would be used to determine which mitigation measures would be required for a particular vegetation management project. 47-4 The source(s) of funding for mitigation/monitoring, implementation timeframe and party responsible for carrying out the measures should also be discussed.

3. 47-5 Protecting water quality means primarily protecting beneficial uses. That protection extends to the most sensitive uses. Municipal water supply and fisheries are the most sensitive uses designated for many Bureau of Land Management (BLM) streams and waterbodies. The FEIS should address the protection of municipal water supply watersheds and offer guidelines for vegetation management activities, particularly with respect to the sensitive issue of herbicide use in those areas. The guidelines should be reflected in the pretreatment surveys for decision-making discussed in Appendix D.

   EPA supports the 'tiering' structure for monitoring and studies identified in the DEIS. All water quality monitoring should be coordinated with the appropriate regional water quality control boards, particularly where herbicide use is contemplated. Some regional boards have special regulations and monitoring requirements for herbicide application. For example, BLM lands located in the jurisdiction of the North Coast and Lahontan Regional Boards are subject to specific mitigation measures, notice requirements and the issuance of waste discharge requirements prior to undertaking aerial herbicide application.

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47-6 4. The degradability of atrazine, diuron, dicamba, 2,4-D, fosamine, picloram and simazine is highly dependent on microbes in the soil and water. The number of microbes in soil decreases with soil depth. Additionally, "ground water contains few if any microbes to carry on degradation" (p. 3-6). The DEIS states that "no herbicides applied on BLM-administered lands have been reported to reach groundwater". It is not clear what types of monitoring, reporting or number of treatment cases were used to reach this conclusion. The FEIS should identify specific ground water protection, monitoring and reporting requirements, particularly given the leaching potential of 11 of the 16 herbicides proposed for use (see Toxics comment #3).

47-7 5. The FEIS should discuss the rationale for using a 10 foot buffer strip around streams and other waterbodies when using granular formations of herbicides (p. 1-10). This conflicts with the statement in appendix D-2 that minimum buffer strips will meet or exceed state-mandated water related buffer zones, which are greater than 10 feet. A 10 foot buffer may not provide adequate protection. For example, tebuthiuron is normally applied in a granular formulation and is quite persistent (Table 3-1, p. 3-3 and Appendix F, p. F-9). In addition, is is moderately mobile and may be leached into surface water as a result of precipitation. Although it appears to be relatively benign to animals it is highly toxic to plants. The combination of persistence, mobility and toxicity may result in significant impacts to aquatic and riparian vegetation if only a 10 foot buffer zone is required.

47-8 6. The DEIS states that "in the desert area there is a need to reduce tamarisk invasion around desert streams and waterholes" (p. 1-1) and identifies herbicide application as a means of controlling tamarisk (p. 1-10). Herbicide movement into waterbodies may result from precipitation, transmission through root systems and fluctuations in dam releases. The effects of herbicides on water quality and beneficial uses could be magnified in closed drainage systems or systems which include wetlands. The FEIS should discuss specific measures which would prevent herbicides from entering waterbodies adjacent to treated areas.

7. The DEIS states that the only potential for fisheries/aquatic impacts are from aerial sprays in big sage and forest habitats (p. 3-19). This represents a significant portion of proposed annual herbicide treatments. The DEIS states that 2900 acres of sagebrush and 600 acres of forest would receive aerial spray treatments under alternative 1. If aerial treatment levels remain constant over the 10 year planning period, 35,000 acres providing watershed for fisheries habitat could be impacted. Herbicide application to tamarisk adjacent to streams and waterholes may also impact water quality and aquatic habitat. The DEIS assumes that standard operating procedures and site-specific environmental assessment (EA)

47-9 recommended mitigation will prevent significant amounts of herbicides from reaching streams. It also assumes that fish will receive only short-term exposure. The FEIS should provide the basis for these assumptions.

8. Page 2-3 of the DEIS acknowledges that BLM is required to meet state water quality standards regardless of the management activity, and to manage in a manner to protect or enhance water quality where standards have not been established. 47-10 The FEIS should discuss in detail the measures, including best management practice development, which will ensure the maintenance or enhancement of water quality.

47-11 9. Does BLM have its own specifications for spill protection plans beyond reliance upon contractors? Have BLM mitigation measures been approved by the State Water Resources Control Board as sufficient to prevent water quality impacts (p. 1-17)?

47-12 10. The basis for the assumption that the proposed use of 16 herbicides would not degrade soil productivity should be discussed in the FEIS. Information documenting the effects of herbicide application on soil microorganisms, fungi and invertebrates should be discussed.

47-13 11. Page 3-3 of the DEIS indicates that chemical removal of solid stands of vegetation would result in only short-term, insignificant increases in erosion. The FEIS should provide the basis for this conclusion.

47-14 12. The DEIS indicates that herbicide treaments would occasionally have to be repeated in some situations but that usually a single treatment would suffice (p. 1-5). It is our understanding that several applications, particularly during the reforestation process, are often required. Methods of resource utilization involving less intensive physical and chemical treatments usually result in better protection of water quality and beneficial uses. All-age management, for example, generally results in better maintenance of fisheries and wildlife habitat in forested areas than even-age management.

The FEIS should identify the types of sites or management areas which could require repeated mechanical and chemical treatments, and discuss special water quality protection measures which would be afforded these areas.

13. EPA's review of BLM Resource Mangement Plans and Wilderness Study Area EISs indicates that livestock grazing has resulted in large areas of range in poor condition. 47-15 The combined impact of vegetation management activities and grazing on soil erosion and water quality impacts should be identified in the FEIS.

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General Process Comments:

1. 47-16 The FEIS should identify the process followed for decision-making regarding individual herbicide application sites. It should discuss the "tiering" process which will be used to relate the potential impacts of a given project to the Vegetation Management Plan (VMP). 47-17 The DEIS does not adequately address potential cumulative impacts from herbicide use.

   47-18 The FEIS should describe how the VMP will be used in relationship to subsequent National Environmental Policy Act (NEPA) documents for individual projects, especially with regard to those projects that involve herbicide application. Page 1-15 of the DEIS indicates that EAs will be prepared on future individual projects. We are concerned about the ability of EAs for individual projects to assess the potential cumulative impacts of vegetation management activities within a given watershed. The FEIS should also discuss the process for public and interagency involvement if EAs are prepared.

2. 47-19 The FEIS should discuss the process and criteria used to determine whether or not a categorical exclusion is appropriate for individual projects. The method in which BLM will coordinate with the public (beyond adjacent landowners) to ensure adequate input into the EA decision-making process should also be discussed. This is paricularly important because a programmatic EIS normally does not provide a detailed site-specific analysis. This places a heavier burden on the EA process to analyze specific impacts to a given site. EPA encourages the BLM to make extensive efforts to involve the public in future EA and categorical exclusion preparation.

Herbicide Comments

1. EPA commends BLM's decision to avoid the use of herbicide formulations with identified "inert" ingredients of toxicological concern.

2. Appendix D, Herbicide Project Design Features, addresses EPA's major concerns with respect to applicator training, certification and oversight.

3. 47-20 Atrazine, Bromacil, Dalapon, Dicamba, Diuron, Glyphosate, Hexazinone, Picloram, Simazine, Tebuthiuron and 2,4-D have been identified as pesticides with the potential to leach and contaminate ground water. Given the potential of 11 of the 16 herbicides proposed for use to contaminate ground water, the FEIS should identify the process and criteria which will be used to identify the monitoring and restrictions placed on the use of these herbicides, particularly in sensitive areas.

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4. Table 3-1 of the DEIS indentifies persistence rates for the 16 herbicides based on usual application rates in moist, fertile soils, at summer temperatures in a temperate climate. "In general, arid soils would have longer herbicide persistence than other soils" (p. 3-3). Over 73% of the areas where herbicide treatments are proposed are chaparral and sagebrush plant communities. 47-21 The FEIS should discuss how higher than normal application rates and arid, less-productive soils were factored into projected persistence rates for the 16 herbicides. If applications are planned during fall, spring or winter, the effect of lower temperatures on persistence rates should also be discussed.

47-22 5. The FEIS should describe the processes ensuring that: BLM district and resource area offices are notified of new developments on the regulatory status of the chemicals proposed for use; on-hand chemicals identified as no longer useable are pulled from use in district and resource area offices; supplies of obsolete chemicals located in district and resource area offices are properly disposed of.

6. Page H-A-9 of the DEIS concludes that N-nitrosoglyphosate (NNG) is not likely to form after the application of glyphosate. The DEIS indicates that nitrite levels, necessary for NNG formation, are not generally found in forest soils. 47-23 The FEIS should discuss whether fetilizers applied during the reforestation process could elevate nitrite levels which would allow NNG formation.

47-24 7. The FEIS should expand discussion on the 11 herbicides with moderate to high leaching potential to incorporate potential factors such as subsurface flow as a means of transport to surface waters and degradation rates in an abiotic environment.

47-25 8. The DEIS does not discuss the breakdown products of the herbicides proposed for use or their potential impacts. For example, the FEIS should discuss the effects of the 'lengthy' persistence of acid forms of hydrolized phenoxy herbicides on aquatic life and beneficial uses. The FEIS should indicate whether or not sampling for such by-products occurs during monitoring studies.

47-26 9. Although the DEIS indicates that a several month to one year period between herbicide application and prescribed burning will be allowed, the FEIS should discuss the potential effects of incineration on the active and inert ingredients of herbicides not yet fully degraded. This should include both areas which would receive herbicide treatments prior to prescribed burning and areas susceptible to wildfire.

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Air Quality Comments

1. Appendix 6 of the DEIS includes a fairly extensive literature review and cancer risk analysis for polyaromatic hydrocarbons released during prescribed burns. The DEIS does not provide an adequate assessment of the potential health impacts from particulate (PM_{10}) emissions produced from 26,000 acres of prescribed burns per year. A new federal standard has been developed for PM_{10}. The FEIS should address prescribed burn impacts on PM_{10} levels, particularly for Group 1 areas (see enclosed map) which are developing air quality plans to address existing PM_{10} problems. 47-27

2. The FEIS should discuss how vegetation management activities will be consistent with protection of Class I air quality increments and criteria in existing and future BLM wilderness areas. Protection of Class I air quality for adjacent U.S. Forest Service or National Park Service wilderness areas should also be discussed. 47-28

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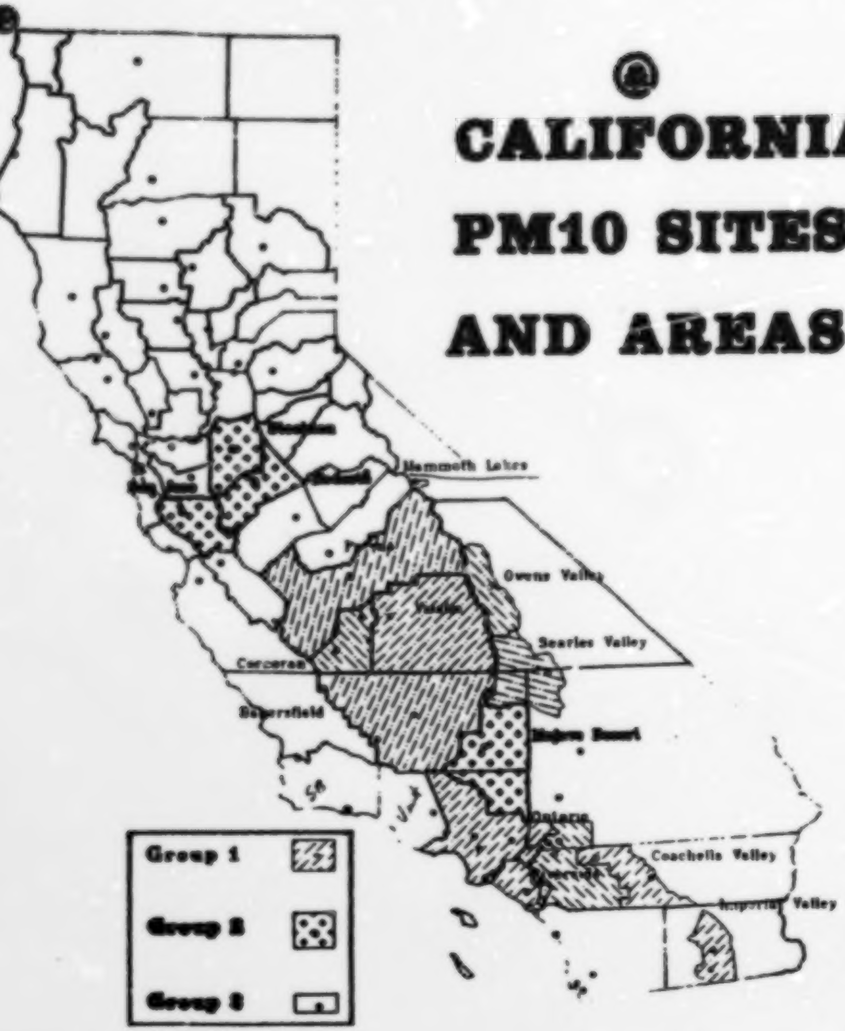
CALIFORNIA PM10 SITES AND AREAS


Mammoth Lakes
Owens Valley
Searles Valley
Corcoran
Bakersfield
Mojave Desert
Ontario
Coachella Valley
Imperial Valley
Group 1
Group 2
Group 3

SUMMARY OF RATING DEFINITIONS AND FOLLOW-UP ACTION*

Environmental Impact of the Action

LO—Lack of Objections

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC—Environmental Concerns

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO—Environmental Objections

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU—Environmentally Unsatisfactory

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of environmental quality, public health or welfare. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

Category 1—Adequate

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2—Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3—Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From: EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

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Response to Comment Letter 47

47-1 The discussion on page 1-1 regarding tiering to the planning process has been expanded.

47-2 Table 3-1 has been expanded to include more information as suggested. It is noted in Chapter 1 that specific project proposals will be evaluated individually based on site characteristics and project objectives. The soil characteristics and effects on them will be one of many factors addressed in making decisions on treatment projects.

47-3 Mitigations to be applied would be developed through the pretreatment surveys and coordination with others. The site-specific EAs will determine which mitigations will be required.

47-4 Discussion on the source of funding is inappropriate at this time. The site-specific project plans will identify parties responsible for different aspects of projects.

47-5 These are values normally considered during individual project plans, in addition two statements have been added to pretreatment survey requirements.

47-6 See response 34-25. Due to the site-specific variations it would be meaningless to identify specific actions for the many different situations which might arise. A statement concerning ground water has been added to Appendix D.

47-7 The 10-foot zone is an absolute minimum in the absence of other requirements or guidance from herbicide label information. The pretreatment survey may also identify resource values requiring a greater buffer than this or even other required buffers.

47-8 The tamarisk treatment is noted to be cut and squirt where the herbicide is only applied directly to the cut stump. While there is some potential for transfer from the roots of treated plants to untreated plants, this is unlikely due to the nature of tamarisk groves. In addition, recent information has shown that triclopyr is as effective as picloram on tamarisk and less persistent in soil. There are no streams controlled by dams on the BLM areas considered for tamarisk control, in fact most areas are associated with springs with relatively stable water levels.

47-9 These conclusions are based on several factors, the main one being the small portion of watersheds to be treated, the evidence from publications such as Ghassemi et al. 1981, showing that only small amounts of herbicide are usually found after treatments and that these levels only last for a short period of time.

47-10 Page 2-4 notes that BMPs will be a part of project plans.

47-11 BLM Manual 9220 has specific guidance to be followed in emergency situations. In addition, the project plan will contain the Material Safety and Health Data Sheet for the particular herbicide. BLM contracts will inform contractors of these requirements and any others which result from the project analysis and EA process. No formal agreement exists between BLM and SWRCB however BLM develops BMPs as part of activity and project plans with Regional Board input.

47-12 The effects of herbicides on soils has been redescribed in Chapter 3. Site-specific characteristics and project design are the most important factors in determining soil productivity impacts.

47-13 This section was rewritten to better describe the situation.

47-14 Page 1-5 has been reworded

47-15 These impacts are more properly addressed by the RMP EISs, grazing EISs, or other encompassing land use plans done by BLM that this EIS is tiered to.

47-16 See page 1-15.

47-17 Cumulative impacts are now discussed on page 3-44.

47-18 As noted on page 1-15 the EA process will address these issues and if significant impacts are likely another EIS will be developed. In this way new issues, cumulative impacts, etc., can be addressed with the additional data available at that time. The narrative beginning on page 1-15 also addresses public involvement in site-specific plans. Involvement at this stage is very appropriate as site-specific features and projects can be discussed in greater depth. Responsibility for this involvement will reside with each District Office.

47-19 Reference to categorical exclusion is deleted as all vegetation treatments will require an EA before implementation. See also response 47-18.

47-20 See response 47-3.

47-21 It is acknowledged that soil characteristics affect persistence greatly and that only with site-specific project evaluation can the effect of herbicides on soil be identified. It should also be noted that in most cases herbicides would be used during the growing season when soil moisture is higher.

47-22 On page 1-7 a discussion on the pesticide use proposal review process has been added.

47-23 Fertilizers are not normally used during reforestation nor is glyphosate normally used in reforestation, therefore this should not be a factor.

47-24 Subsurface flows into streams are not a significant transport mechanism in most BLM areas, and the effects would be similar to those discussed for ground water.

47-25 By-products are discussed in Appendices F and L. If these secondary products would be a concern to the site-specific features the EA would identify the need for testing.

47-26 See page H-90.

47-27 The BLM intends to comply with PM 10 standards. By complying with the standards health effects would be in the acceptable range as determined by EPA during standard determination.

47-28 Currently there are no BLM-managed Class I areas and BLM wilderness areas will be initially classified as Class II. The non-BLM Class I areas will be known to permitting agencies, APCDs, and will influence permit requirements.

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48

TRINITY COUNTY

PLANNING DEPARTMENT
P.O. Box 936
Weaverville, CA 96093
(916) 623-1351

February 11, 1988

California State Director
Bureau of Land Management (932)
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

RE: Draft EIS for California Vegetation Management

Dear Mr. Blakeslee:

The Bureau of Land Management is one of the major land stewards in Trinity County and plays a significant role in the health, safety and well-being of Trinity County residents. Management decisions on lands under your agency's jurisdiction are therefore of importance to this Department. Please include the Trinity County Planning Department and the Trinity County Board of Supervisors on your mailing list for this project. Please forward copies of the Final EIS and the Decision Notice when they are completed to the following addresses:

Trinity County Board of Supervisors P.O. Box 1258 Weaverville, CA 96093	Trinity County Planning Department P.O. Box 936 Weaverville, CA 96093

Attached to be addressed and included for consideration in your final EIS and Decision Notice are the following items:

1) Trinity County Board of Supervisors Resolution #49-87, which declares the application of forest herbicides a public nuisance in Trinity County.

2) A letter to Zane G. Smith, Regional Forester, U.S. Forest Service on the 1986 Supplement to the Draft EIS for Vegetation Management.

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The County's comments to the U.S. Forest Service are relevant, since the BLM's assumptions about "safe" use of herbicides are based on the same data gaps and scientific uncertainty that the Forest Service has used.

The Trinity County Planning Department recommends that the BLM adopt Alternative 3, which calls for no use of herbicides. In addition, the Planning Department is requesting a 45 day extension on the official comment period for this DEIS, since Trinity County received copies of the DEIS only 15 days prior to the comment period deadline.

Thank you for your consideration of Trinity County's official position that no herbicides be used here.

Sincerely,

Thomas Miller,
Planning Director

cc: Board of Supervisors
U.S.E.P.A.

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RESOLUTION NO. 49-87

RESOLUTION RE DECLARING THE APPLICATION OF FOREST HERBICIDES IN TRINITY COUNTY A PUBLIC NUISANCE

WHEREAS, the forest herbicides which will be disseminated in Trinity County by various timber companies in 1987 have shown, in studies, a moderate persistence and significant mobility in water systems; and

WHEREAS, some of said chemicals have been found by the Department of Food and Agriculture to bear such a risk of potential adverse health effects as to require reassessment of their registration for usage in California; and

WHEREAS, significant data gaps exist regarding toxicity, effects of long term exposure, and efficacy of said forest herbicides; and

WHEREAS, some studies indicate that these same chemicals may be responsible in the long term for causing cancer and genetic mutations in those living near herbicide release areas; and

WHEREAS, in Trinity County some residents suffer a decrease in the quality of life and comfortable enjoyment of their property as a result of the use of forest herbicides in Trinity County; and

WHEREAS, such decrease in the quality of life and disruption of the comfortable enjoyment of property presently injures some Trinity County residents; and

WHEREAS, in spite of repeated requests, protests, public outcry, legislative action and litigation the responsible timber companies are allowed by the State of California to persist in the yearly dissemination of said chemicals into the air, water and soil of Trinity County.

NOW, THEREFORE, BE IT RESOLVED by the Board of Supervisors of the County of Trinity, State of California, that the aerial spraying, backpack spraying, pellet release or other release of forest herbicides, including but not limited to, Garlon, Velpar, Roundup or Pronone in Trinity County for

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PASSED AND ADOPTED by the Board of Supervisors of the County of Trinity, State of California, at a regular meeting of said Board, held on the 7th day of April, 1987, by the following vote:

AYES: Supervisors Plowman, Garrett, Twight, Myrick and Meyer

NOES: None

ABSENT: None

CHAIRMAN, Board of Supervisors of the
County of Trinity, State of California.

ATTEST:

BARBARA M. RHODES
County Clerk & Ex-Officio Clerk of
the Board of Supervisors of the
County of Trinity.

By
Deputy

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49

United States Department of the Interior
NATIONAL PARK SERVICE
WESTERN REGION
450 GOLDEN GATE AVENUE, BOX 36063
SAN FRANCISCO, CALIFORNIA 94102

IN REPLY REFER TO:
DES 87/0036(WR-RP)

February 12, 1988

Memorandum

To: State Director, California Field Office, Bureau of Land Management

From: Regional Director, Western Region

Subject: Draft Environmental Impact Statement for California Vegetation Management, DES 87/0036

The National Park Service has reviewed the Draft California Vegetation Management Environmental Impact Statement. We have no comments to offer. We appreciate the opportunity to review and comment on this undertaking.

Stanley T. Albright

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50

THE GROUP FOR ALTERNATIVES TO SPREADING POISONS
10984 Ridge Road • Nevada City, California 95959 • (916) 265-[illegible]

February 12, 1988

California State Director
Bureau of Land Management (932)
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, CA 95825

50-1 The draft EIS for California Vegetation Management fails to consider a full range of alternatives. Alternative 3, no herbicide use, was not even seriously developed. Failure of the alternative because of budget restrictions is admitted on 3-15.

A number of alternatives could be considered. An alternative which seriously defines Integrated Pest Mangaement with chemical control as a last step must be included. An alternative which drops chemicals of significant concern is viable.

The only alternative which this group of concerned citizens can support is Alternative 3 - no herbicides.

50-2 The document also fails in readability. The risk assessment in Appendix H is not correctly summarized in the narrative section. The data gap table - complete for all 16 chemicals - should appear in the environmental consequences chapter. Children and chemically sensitive individuals are mentioned in the Appendix but not in the text. This is unacceptable to a reasoned decision among alternative

50-3 Economic information is totally lacking as a basis for decision-making. We are assured that no herbicides will seriously effect some social environments but there is no information to support the statements. The true costs of herbicide uses - monitoring, litigation, etc. - are removed from economic table E-1.

50-4 All alternatives propose to burn 26,000 acres each year. This decision is not discussed in detail. This a-priori decision should be explained in this document. The implication is that chaparral is burned for the great range/grazing boondoggle that has existed for years in the bureaucracies. This lands are being managed for a resource they cannot support.

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50-5 While taking word-for-word the quantitative risk assessment written for the OR/Wash Forest Service, this document fails to present the qualitative risk assessment which made the material more readily accessible to the general public.

50-6 This document further ignores information regarding accident rates in this area, effects of monitoring water and air quality, efficacy of chemical treatment and of mitigation measures.

Alternative 3 is the only acceptable alternative presented in this seriously flawed EIS.

Sincerely,

Karen High

Karen High for G A S P

KH/ms

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Response to Comment Letter 50

50-1 See response 26-1. Alternative 3 was developed on a reasonable funding basis (see response 37-7).

50-2 A statement regarding data gaps and sensitive individuals has been added on page 3-34.

50-3 Costs which can be forecast are identified and analyzed, however uncertain costs which cannot be attributed to any particular alternative cannot be evaluated.

50-4 Page 1-1 identifies the reasons for prescribed burns.

50-5 The risk assessment was not solely written for Region 6 of the Forest Service. It was prepared under a joint FS/BLM contract and usable by both agencies. The risk assessment was summarized in this EIS in Chapter 3 in a manner we felt more understandable to the general public rather than the complex methodology used by the FS.

50-6 See response 22-1.

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February 12, 1988

MATTOLE RESTORATION COUNCIL

California State Director BLM
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, Ca. 95825

People:

The Mattole Restoration Council and its member groups have worked for over 8 years restoring and enhancing salmonid populations and their watershed-wide environment in the Mattole watershed. We have discovered that salmon live in watersheds, not in creeks, and that what happens upslope determines the fate of salmon. Therefore, we have focused much of our attention on reforestation, revegetation, and erosion control as part of watershed-wide salmon enhancement.

Since 12% of the Mattole watershed is in the King Range National Conservation Area, we are very interested in your methods of vegetation management.

Box 122, Petrolia, CA. 95558
~~3848 WILDER RIDGE RD., GARBERVILLE, CA 95440~~

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It must be added, that the 12% of Mattole in KRNCA is of an, (unfortunately, rare) high quality in regards to water quality, healthy forests, and generally intact nature. This fact makes the 12% extremely important to the health of our watershed. Three of the 5 largest and most productive tributaries of the Mattole lie partially or nearly wholly within the King Range. Since not only salmonids, but also human inhabitants depend on quality water from creeks originating in the King Range, we are adamantly opposed to the use of herbicides in the King Range, the Mattole watershed, or any other place in California.

We oppose the use of herbicides on the general grounds of

1- herbicides threat to human & salmonid health
2. herbicides impairment of soil health + productivity, therefore the impairment of vegetation & forests regeneration
3- the economic choice of investing in centrally produced, corporate chemicals vs investing locally by hiring people to manually clear brush

1: Many of the herbicides proposed have never even
51-1 been fully tested for toxicity and are not
registered by EPA for safe use. their use
by government agencies against the wishes of
local inhabitants is analagous to chemical
experimentation.

In the Mattole, rainfall is extremely high &
runoff during the winter months is tremendous
Many herbicides are known to not adhere
51-2 well to soil particles, therefore susceptible
to percolation into water tables +
creeks this is unacceptable.

2: Herbicides destroy mychorhizal fungi
in soil, making the re-establishment of
51-3 vegetation (conifers) a more difficult and
expensive task after herbicide treatment of
a site.

3: Humboldt county needs jobs and the
↓ BLM could provide them instead of using

herbicides, and save ㊶ in the long term by preserving the water + soil quality.

In addition, the poisoning of wildlife by herbicide spraying is repugnant to us and a violation of your responsibility as stewards of the King Range.

Since a full conifer rotation has not yet been grown on the northcoast (we ave been subsiding on the old growth), your opinions on management of vegetation based on competition between hardwoods + conifers is conjuncture and also based on the impatience of being unable to wait through natural successive stages involved in forest production. Reconsider this position.

No herbicide use in BLM lands in California

Sincerely, Jan Morrison
Chairwoman, MRC

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Response to Comment Letter 51

51-1 All herbicides proposed for use are registered by EPA and the State of California for the uses proposed.

51-2 Herbicide adherence to soil, degradation and longevity are addressed in Table 3-1 and Appendix F.

51-3 Mycorhizal fungi will not necessarily be destroyed by herbicide use. The variation of effects on microorganisms is acknowledged in the soils discussion in Chapter 3.

51-4 See response 36-3.

51-5 The likelihood of poisoning of wildlife is discussed on pages 3-18 to 3-22 and Appendix L.

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STATE OF NEVADA

RICHARD H. BRYAN
Governor

JEAN FORD
Director

OFFICE OF THE GOVERNOR
OFFICE OF COMMUNITY SERVICES
Capitol Complex
Carson City, Nevada 89710
(702) 885-4420

February 17, 1988

California State Director
Bureau of Land Management (932)
c/o Mark Blakeslee
2800 Cottage Way
Sacramento, California 95825

Re: SAI NV #88300050 Project: Draft EIS - California Vegetation Management

Dear Mr. Blakeslee:

Attached are the comments from the Nevada Department of Wildlife concerning the above referenced project.

These comments constitute the State Clearinghouse review of this proposal as per Executive Order 12372. Please address these comments or concerns in your final decision.

Sincerely,

John B Walker

John B. Walker, Coordinator
State Clearinghouse, NOCS/SPOC

JBW/ll
Enclosure

12/9/87

NEVADA STATE CLEARINGHOUSE

OFFICE OF COMMUNITY SERVICES
1100 EAST WILLIAM, SUITE 118
CARSON CITY, NEVADA 89710
885-5187

FROM: John B. Walker, Coordinator

TO:

- ☐ Governor's Office
  - ☐ Community Services
  - ☐ State Job Training Office
- ☐ Administration
- ☒ Agriculture
- ☐ Economic Development
- ☐ Education
- ☐ Employment Security Department
- ☐ Human Resources
  - ☐ Aging Services
  - ☐ Health Division
  - ☐
- ☐ Legislative Counsel Bureau
- ☐ Minerals
- ☐ Nuclear Waste Project Office
- ☐ Prisons
- ☐ Public Service Commission
- ☐ SOICC
- ☐ State Communications Board
- ☐ Taxation
- ☐ Tourism
- ☐ Transportation
- ☐ UNR-Bureau of Mines
- ☐ UNR Library-Gov. Publications
- ☐ UNR-Dept. of Range, Wildlife, and Forestry
- ☐ Wild Horse Commission
- ☒ Wildlife

Conservation and Natural Resources

- ☐ Director's Office
- ☐ State Lands
- ☐ Environmental Protection
- ☐ Forestry
- ☐ Historic Preservation and Archeology
- ☐ State Parks
- ☐ Water Resources
- ☐ ____________________
- ☐ ____________________
- ☐ ____________________
- ☐ ____________________

SAI NO # 88300050 **PROJECT:** Draft EIS - California Vegetation Management

[illegible] ____________

Attached for review and comment is a copy of the aforementioned project. Please evaluate it with respect to: 1) the program's effect on your plans and programs; 2) the importance of its contribution to State and/or areawide goals and objectives; and 3) its accord with any applicable laws, orders or regulations with which you are familiar with.

PLEASE SUBMIT YOUR COMMENTS NO LATER THAN 2/[illegible]/88. Type your comments if applicable, check the appropriate box below and return the form to this office. Please do so even if you have no comment on this project. If you are unable to comment by the prescribed date, please notify this office. Reviewers may substitute this form with agency letterhead. If letterhead is used, please cite the SAI number listed above.

THIS SECTION TO BE COMPLETED BY REVIEWING AGENCY:

- ☐ No comment on this project
- ☐ Proposal supported as written
- ☐ Additional information (see below)
- ☐ Conference desired (see below)
- ☒ Conditional support (see below)
- ☐ Disapproval of funding (must specify reason below)

CLEARINGHOUSE NOTES:

This EIS should have been sent directly to you by BLM. If you have not received a copy, please inform this office and we will request the document for you.

AGENCY COMMENTS: (use additional sheets if necessary)

Support actions that reduce chemical spray use. Prefer either no change or no herbicides alternatives.

RECEIVED ON

FEB 17 1988

OFFICE OF
COMMUNITY SERVICES

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Appendices

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CORRECTIONS TO THE DRAFT EIS APPENDICES

Page No.	Correction
B-7	Last word in paragraph should be sufficient.
C-1	Tamarisk eradication. Add "or triclopyr" after picloram on fifth line.
D-1	Add as 1(a): On-site resource values--domestic water supply, fisheries, recreation, etc.
	2(b): Off-site resource values--same as (a) and nearby residences, etc.
	Add to 4(b): based on the reentry requirement of the specific herbicide.
	Add to 4(c): Consider also leaching to ground water.
	Change 4(f): (water) to (surface and ground water and other chemical residues).
	Add to 4(g): A copy of the herbicide label will be a part of the documentation as will the herbicide Material Safety and Health Data Sheet.
D-3	Second paragraph, change different to stricter.
	Add: 15. Personal protection equipment recommended by the herbicide Material Safety and Health Data Sheet will be used and workers trained in its use and maintenance (see 29 CFR 1960.34(b)).
D-4	Change number 9 last word wet to moist to touch.
E-1	See attached revision of page E-1.
F-1	Delete reference to Amino Triazole and change confer on first line to conifer.
F-5	Delete M following Dowpon.
F-15	Delete and Brush Bullets.
H-32	Fourth paragraph, change reference to six herbicides to eight herbicides and add asulam and bromacil to listing.
H-46	See attached revised Table H-6.

The entire page E-1 is updated as follows:

APPENDIX E

ANALYSIS OF PROGRAM COSTS

Program costs were analyzed to provide a monetary basis for comparing the alternatives. The average costs presented below include costs of chemicals, labor, equipment and administration of the treatment. Costs do not include EIS preparation, litigation, accidents or training. The costs used are estimates based on recent prescribed burn projects within California and the costs used by the USFS Region 6 DEIS Managing Competing and Unwanted Vegetation (USDA FS 1987). It should be understood that different projects within the same treatment category have variable costs depending on the characteristics of each project.

Vegetation Management Program Costs

	Cost/Acre 1/	Alt. 1	Alt. 2	Alt. 3
Aerial Application	$60	$ 312,000	$ 0	$ 0
Ground Vehicle Application	$60	48,000	48,000	0
Ground Hand	$135	121,500	155,250	0
Manual	$200	100,000	100,000	240,000
Mechanical	$135	324,000	378,000	452,250
Prescribed Burning	$100	2,600,000	2,600,000	2,600,000
Total Cost		$3,505,500	$3,281,250	$3,292,250
Total Acres Treated		35,800	31,250	30,550
Cost Per Acre		$97.92	$105.00	$107.76

1/ Not all costs are incurred by BLM. Costs on R-O-Ws and leases would be incurred by permittees. Weed control costs are at least partially paid by counties and/or state, while a great deal of volunteer labor or contributed costs are received by BLM for prescribed burns and tamarisk control.

Table H-6 on page H-46 has been revised as follows:

Table H-6
Brand Names of Herbicides Proposed for Use[1]

Herbicide	Brand Name	EPA Registration Number
Amitrole	Amitrole T	264-135
Asulam	Asulox	359-662
Atrazine	Drexel Atrazine 4L	19713-11
	Drexel Atrazine 5L	19713-80
Bromacil	Hyvar X	352-287
	Hyvar XL	352-346
2,4-D	Weedone LV4 [2]	264-20
	Weedar 64	264-2
2,4-DP	Brushbuster [4]	264-307-54705
	Brushkiller [4]	264-307-ZA-909
Dalapon [3]	Dowpon	464-164
Dicamba	Banvel	55947-1
Diuron	Karmex	352-247
Fosamine [3]	Krenite	352-376
Glyphosate	Rodeo	524-343
Hexazinone	Velpar L	352-392
	Pronone 10G	33560-21
Picloram [3]	Tordon 22K	464-323
	Tordon RTU	464-510
Simazine	Drexel Simazine 80	19713-46
	Princep 80W	100-437
	Princep 4G	100-435
Tebuthiuron	Spike 80W	1471-97
	Spike 20P	1471-123
	Spike 40P	1471-124
Triclopyr	Garlon 3A	464-546
	Garlon 4 [2]	464-554

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[1] These products contain no inert ingredients (except for those under 2/) of concern for toxicity as identified on EPA's Lists 1 and 2. Other brands may also be used as long as they too do not have inerts identified on List 1 or 2 by EPA.

[2] Contains petroleum distillate.

[3] Registration has not been renewed for these products in California. They may be available for use until supplies are depleted, however it is expected they will be unavailable for use in California within the next two years.

[4] Information on inert ingredients not available at printing time. Information on inert ingredients will be obtained before use.

203

Page No.	Correction
J-7	Add the following two plants:
	Eriastrum densiflorum ssp. *sanctorum* Santa Ana wooley star Polemoniaceae E California Desert
	Centrostegia leptoceras Slender-horned spine flower Polygonaceae E California Desert
J-8	For *Brodiaea insignis* change S following Bakersfield to K.
J-9	For *Calystegia stebbinsii* change S following Bakersfield to K.
J-10	For *Coreopsis hamiltonii* change S to K.
J-13	For *Fritillaria falcata* change S to K.
J-14	For *Lupinus spectabilis* change S to K.
L-85	Add the following:

Burt, W.H. and R.P. Grossenheider. 1966. A field guide to the mammals. Boston: Houghton-Mittlin.

Gordon, M.S., G.A. Bartholomew, A.D. Grinnell, C.B. Jorgensen, and F.N. White. 1968. Animal function: principles and adaptations. New York: Macmillan Publishing Company.

Hutchinson, V.H., W.G. Whitford, and M. Kohl. 1968. Relation of body size and surface area to gas exchange in anurans. *Physiological Zoology* 41:65-85.

Kendeigh, S.C. 1970. Energy requirements for existence in relation to size of bird. *The Condor* 72:60-65.

Lasiewski, R.C. and W.H. Calder, Jr. 1971. A preliminary allometric analysis of respiratory variables in resting birds. *Respiration Physiology* 11:152-156.

Robbins, C.S., B. Bruun, and H.S. Zim. 1983. A guide to field identification: birds of North America. New York: Golden Press.

Schmidt, J.L. and D.L. Gilbert. 1978. Big game of North America. Harrisburg, PA: Stackpole.

Schmidt-Nielsen, K. 1972. How animals work. New York: Cambridge Univ. Press.

Scott, V.E., K.E. Evans, D.R. Patton, and C.P. Stone. 1977. Cavity nesting birds of North American forests. USDA Handbook No. 511. Washington, D.C.

Page No.	Correction
REFERENCES	Add the following references:

Anderson, H.W., M.D. Hoover, K.G. Reinhart
1976. Forests and water: Effects of forest management on floods, sedimentation and water supply. USDA Forest Service, General Technical Report PSW-18/1976.

Dimock II, E.J., T.F. Beebe, and E.B. Collard
1983. Planning - site preparation with herbicides to aid conifer reforestatioan. Weed Science 31:215-221.

Oliver, W.W.
1982. Brush reduces growth of thinned ponderosa pine in northern California. USDA Forest Service, Research Paper PSW-172. Pacific Southwest Forest and Range Experiment Station, Berkeley, CA.

Sawyer, J.O., D.A. Thornburgh, and J.R. Griffin
1988. Mixed evergreen forest - terrestrial vegetation of California. pp. 359-381. Edited by Barbour, J.G. and J. Major. California Native Plant Society.

Scifres, C.J.
1977. Herbicides and the range ecosystem: residues, research, and the role of rangemen. Journal of Range Management 30(2):86-91.

U.S. Department of Agriculture, Forest Service
1987. Managing competing and unwanted vegetation. Draft EIS. Pacific Northwest Region.

Walstad, J.D., J.D. Brodie, B.C. McGinley, and C.A. Roberts
1986. Silvicultural value of chemical brush control in the management of Douglas-fir. Western Journal of Applied Forestry 1:69-73.

Wright, H.A. and A.W. Bailey
1982. Fire ecology, United States and Southern Canada. John Wiley and Sons.

Add the following information to end of References Appendix:

BLM LAND USE PLANS BY DISTRICT

Bakersfield District

Benton/Owens Valley MFP, 1982
Bodie/Coleville MFP, 1983
Sierra MFP, 1983
Hollister RMP, 1984
South Sierra Foothills MFP, 1984
Coast Valley RMP, 1985
Timber Management EA Sustained Yield Unit 15, 1981

Susanville District

Tuledad/Homecamp MFP, 1979
Cowhead-Massacre MFP, 1981
Cal-Neva MFP, 1982
Willowcreek MFP, 1983
Honey Lake-Beckwourth MFP, 1984
Alturas RMP, 1984
Timber Management EA Sustained Yield Unit 15, 1981

Ukiah District

King Range MFP, 1974
Scattered Blocks MFP, 1982
Redding MFP, 1982
Mt. Dome MFP, 1982
Yokayo MFP, 1984
Arcata RMP, in progress. Will replace portions of other plans pertaining to Arcata Resource Area.
Timber Management EIS Sustained Yield Unit 8 (within King Range Plan EIS), 1974
Timber Management EIS Sustained Yield Unit 13, 1981
Timber Management EA Sustained Yield Unit 15, 1981

California Desert District

California Desert Plan, 1980 and as amended
Eastern San Diego County MFP, 1981